Paper Production Needs Protection

WHEN an individual gets sick, we call in skilled medical men and have a diagnosis of the ailment made and treat the case accordingly.

When an industry gets sick, what should we do? Proceed in exactly the same manner as we do in the case of individual sickness.

Now, the paper industry along with other brother and sister industries, such as the oil business, the leather, textile, metal, coal and agricultural industries, have all been sick. Some of them have been awfully sick.

The diagnosis in every case has shown they were all suffering with the same ailment—an ailment that has amounted to an epidemic—OVER-PRODUCTION.

Over-production is a dreadful disease. In its final stages, it produces anemia from which there is no relief and the final resting place of the industry or division of industry so infected, is the financial undertaking establishment—the bankruptcy court.

In addition, over-production is infectious, and deadly in its moribund contacts.

Over-production, not only is profitless to the industry contaminated with it, but it spreads its profitless contagion to all related industries.

Tuberculosis is a wretched problem in individual life. We check it, however, by isolating the person or persons contracting it.

The infectious germs of over-production, however, are infinitely more widespread and insidious.

The low price quotation germ thrown throughout the industrial and commercial body, as a result of the over-producing concerns, inoculates the entire business world as it circulates through the veins and arteries of the trade.

Continued over-production saps the life of productive capacity by changing the profit corpuscles into loss corpuscles—the result is a weak, anemic, energyless productive function.

Why should we not isolate over-producing industries and the infected units in those industries?

That something of this kind will be the program of the future is now in evidence.

The baneful effects of uncontrolled production are generally recognized. Bankers are now refusing to loan money for plant extensions, new machinery, or increase in productive capacity in any industry wherein over-production is apparent. Investors are refusing to buy stocks or bonds in those corporations where over-production exists or is liable to eventuate. This is a move in the right direction.

Production needs control.

Production should be surrounded with every care and hygienic safeguard.

There is no reason why production should be like the Chinese nation—ignorantly increasing.

Controlled production means healthy profits. Over-production means no profit. Without profit, industry must cease to produce.

Therefore, stop over-production; cease building more mills; quit enlarging plants that cannot se-

E D I T O R I A L

cure business enough to run at capacity as they are. Supplant old machinery with new and better methods and processes, but if such processes result in an over-production, shut down.

The consuming body can absorb only a given quantity of commodities. You cannot force more than that given quantity onto the consumer than you can force more food into the stomach of an over-loaded person.

Over-production of commodities has caused the consumer to back away from the menacing volume of goods moved his way. The result is a hand-to-mouth buying policy and a continued lower commodity price.

The consuming public does not demand over-production of commodities. It doesn't like it and it erects penalties against it.

Why then will paper manufacturers continue month in and month out, year in and year out, this deleterious folly of over-production of paper?

The paper industry is known today far and wide as a non-profitable industry. Stocks in the leading corporations are all selling far below par. No dividends are paid and huge losses are made. What's wrong with this picture?

OVER-PRODUCTION first.

Brainless, uncontrolled operations first, last and —not always.

The time is right now when a change must come.

The investing public are buying the securities of those corporations in whose management they have confidence.

The way to bring the confidence of the public back to paper mill securities and paper commodities is to so manage our operations that over-production will cease and controlled production obtain.

Nations as Partners

WITH much to hear and much to say, the Foreign Trade Convention held its sessions in Detroit, May 25, 26, and 27, and world-wide representatives listened with interest to a semblance of ideas on peace and, most of all, furtherance of foreign trade in the future between the United States and other countries.

Bankers talked of billions and ideals, manufacturers talked of imports and exports, and international peace, but all present emphasized the central idea of success being marked by the fact that the current of world development, civilization, peace and prosperity flows best in the channels of world trade.

American idealism seemed to be the first sounding keynote, and it was expressed as a sincerity of loyalty to give safe buys to investors abroad as well as to those at home, because of competitive conditions existing in financial channels today. With competitive conditions facing the banks of the United States, and the knowledge that if their investments are not fair, England, or other countries will give the investor a fairer investment, the prominence of this condition seems forcefully existent.

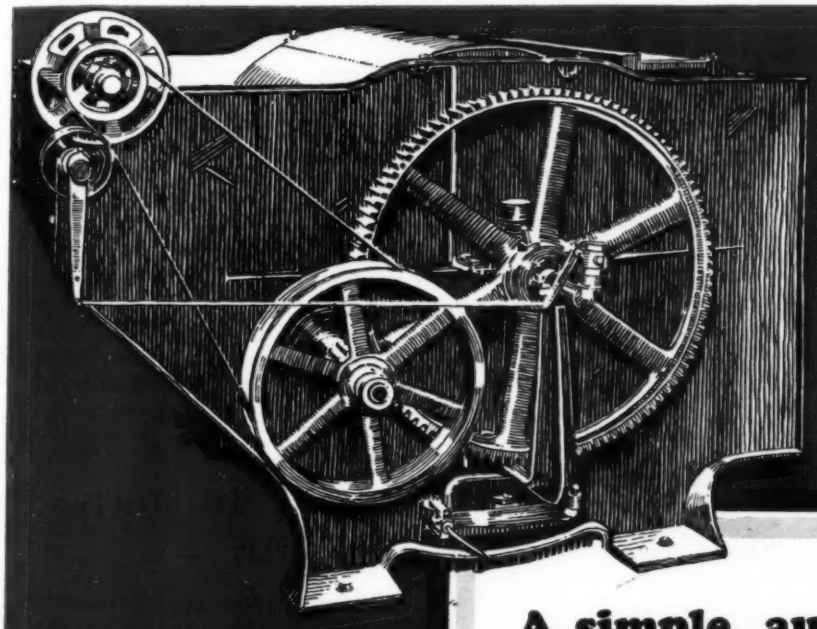
Foreign advertising in the United States is one of the mediums that will enhance and improve foreign trade, whether the nation be Canada, or the Latin Americas, for in that way only can America learn something about the products of that country, purchase them, and further their sale, instead of learning only of beautiful scenery in foreign lands to draw the tourist there, who comes primarily as a pleasure seeker, and not as a seeker of business or trade.

The value of fostering and furthering private shipping in conjunction with government ship ownership because of the aid which it gives to the development of the country's commerce and to national defense, was strongly emphasized.

Tariff in the future will be more a question of economics than politics—the best measure being that which protects and maintains the high standards of living of a people.

It is refreshing to feel that "idealism"—American idealism as voiced by one of the leading speakers at the Foreign Trade Convention, is such that we can realize consummate gratitude through knowing that America has, since the World War, fed the best of her standards and finances to the financial reconstruction of honest minded countries in Europe, and that the almighty dollar has not played such a sordid part as many would try to make us believe.

But most of all, the idea emanating from the convention, and one that should weigh heavily in the future on the minds of those who would profit from foreign trade, is the idea of a merging of all markets into **one great market,** instead of a conglomeration of rival markets. In other words, that nations are to be partners instead of rivals, if they are to increase their foreign trade relations, profits, and benefits between one another, and countries anxious to find a market for their products must reciprocate by returning some of that profit in the markets of American products who seek a greater growth abroad.



A simple, automatic, low cost pulp saver and white water filter that recovers close to 100% of the solids in the white water at minimum cost per pound of fibre recovered.

The BIRD SAVE-ALL

BIRD MACHINE COMPANY

South Walpole : : Massachusetts

BIRD MACHINERY

EDITORIAL

The Flood Conference

SPEND generously on control and not later on relief was the message relayed by twenty-seven State leaders attending the Flood Control Conference in Chicago, June 2-3-4. National attention was focused upon the demands of the Mississippi Valley for Federal flood control. Public hearings for suggestions will be held and seemingly workable plans picked out and tested for their engineering and economic value before submission to Congress when it convenes in December.

America can no longer step aside or procrastinate in a now fully realized **national** problem for the protection of this area where a billion dollars' property loss has been sustained. Valuable measures as ounces of prevention will be worth all the millions of pounds of cure.

Figures of Production and Shipment Wanted

THE importance to an industry of obtaining timely and accurate monthly figures of production and consumption is something that is generally recognized. The ability of a manufacturer to make profits and so assure the financial success of the enterprise in which he is engaged depends to a great extent on his ability to forecast market conditions, both as regards possible consumption and total production of goods in his line of manufacture; for it is by such figures that he should be able to form estimates for future quotas and so adjust his own rate of production with the purchasing capacity of consumers. Without such statistics a company exposes itself to the risk of overproduction, which in turn might lead to excess stocks and in most cases thereby create a condition neither economically nor financially sound. In rare instances a company that is exceptionally well financed may assume the risk of large inventories, but as a general rule the policy is one calculated to produce an unstable condition of business.

Ever since the abandonment by the Federal Trade Commission of the collection and publication of pulp and paper mill statistics, the American Paper and Pulp Association has carried on the work of providing figures of production and shipment, together with statistics of current developments in practically all grades of pulp and paper, but the exchange of this information has been confined to mills in membership. The policy in this respect has now been changed and arrangements have been made whereby non-member mills may send in their monthly production and shipment figures to the association and receive in exchange the total figures on the grades reported from all other mills contributing similar statistics.

It is to be hoped for the stabilization of the industry in this country that all United States mills, not now reporting to the American Paper and Pulp Association, will improve the opportunity to exchange information in this way and so effect a coordination of effort that is calculated to be of so much benefit to the industry generally and be of particular value to individual mills.

American Clay in Better Repute

ONE of the important papers read before the meeting of the American Pulp and Paper Mills Superintendents' Association in Richmond, Va., last week, dealt with the use of American paper coating clays in American mills. It has taken a long time for American clays to win recognition but it is evident that through new or improved processes of washing and settling, paper clays of American origin are now available that can compete with English clays in both price and quality.

There is no more authentic native American industry than clay mining, the Cherokee Indians having been perhaps the first to engage in the mining of china clay at the foothills of the mountains which mark the northwestern boundary line of North Carolina. There are even traces of prehistoric workings, crude mining implements of stone having been unearthed in that region by recent operations. American clays were exported to England long before the discovery and utilization of similar clays in that country.

Kaolin, as the purer form of china clay is called, is mined in the southern Appalachian region of Pennsylvania, Delaware, Virginia, Florida, Georgia and North and South Carolina. The clay is sedimentary in origin, usually covered with a heavy overburden of earth and rock, which must be cut through or mined in order to expose clay for removal by pick and shovel.

The processes of washing and removing traces of sand and other gritty material from American clays before settling them have been marked by many improvements during the past few years, which accounts for the better reputation which they now possess.

Harold T. Edgar, author of the paper referred to above, makes the statement that "American clays are now being produced with a lower grit content, lower moisture content and of more uniform composition than any other clays produced anywhere else in the world."

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Ways of Calculating and Building Up the Advertising Appropriation

By J. J. BERLINER

Accountant and Auditor

HOW shall I figure the advertising appropriation is a question that is constantly being asked by business executives. To answer this question, it is essential to have a knowledge of the various methods used at present in calculating advertising appropriations.

The methods of calculating the advertising appropriation can be arbitrarily classified as follows:

1.—By taking a fixed percentage of the sales. Sometimes the sales figures for the past year are used. In other cases, the anticipated sales for the coming year form the basis of computation.

2.—By an assessment of a certain unit of the product. Here, also, the number of units sold in the previous year or the number of units that is expected to be sold next year, may be used.

3.—By putting all the money that can possibly be obtained into advertising, as an investment in future sales. This is a demonstration of superior faith in advertising, and is based on the proverb of "Casting bread on the waters." Often the investment may be out of all proportion to the immediate sales or profits of the business.

4.—The Budget System.

5.—By finding out how much advertising it takes to get a new user or a new dealer for a given product, and then appropriating enough money to get as many as are wanted that year.

6.—By investing in advertising to bring inquiries or direct sales. This is the usual mail order method.

7.—By ascertaining the minimum job to be accomplished by the campaign, and then deciding on the mediums and size necessary to put over the task.

8.—By appropriating a certain percentage of the previous year's profits.

9.—In addition to the above methods, the element of competition must be considered. It is necessary to watch the activities of competitors and then set aside enough advertising funds to "go them one better."

10.—A plan that combines the percentage of sales and the Budget System. A definite percentage of sales is unfailingly appropriated each year, say 5 per cent. This is placed in an advertising fund. The budget varies according to the exigencies of the business. It may be more than the amount derived from the percentage of sales, but more often it is less. Where it is less, the difference piles up in the fund for use in those years where more advertising is needed than is provided by the current assessment on sales.

11.—Taking out an insurance policy in the form of advertising investment, to protect the company's accumulated good will (is a method that is advocated by Printer's Ink, Dec. 9, 1920 issue).

Supplementing the above methods, it must be borne in mind that the volume of the advertising appropriation has to be determined by the nature of the business or product, by the character of the market, and by the price of the product, as well as the profit.

Method No. 1—Obtaining the Appropriation by a Percentage of Sales. This method is probably the most commonly used plan. Actually, hundreds of business executives arrive at their appropriations by an approximation of this method. One reason for its popularity is its mathematical simplicity. There is something very definite about it. Furthermore, it has other advantages, as stated by the president of one of the largest advertising agencies in New York, in the following words: "I favor the practice of fixing appropriations upon the percentage of sales of established concerns, and on the basis of estimated sales within a reasonable time with new enterprises. This plan designates sales as a primary product of advertising, and good will as a secondary product.

In short, the object in view is—sales—increasing sales—permanency of sales—and good will."

Advertising percentages obtained in this manner usually vary from 2 to 5 per cent. They run as low as 1.62 per cent. The total sales and advertising expenditure in the case of Sunkist fruit is as high as 10 per cent, and in some cases even higher. The percentage of sales used for advertising in any one industry is really of little significance for the reason that these percentages vary extensively even in the same industry. The percentage that one concern is using is not a criterion or basis for other concerns. Market conditions might be entirely different, thus affecting the advertising appropriation required, to considerable extent.

However, many advertising men do not look with favor on the percentage of past sales plan. They hold that it does not allow sufficient latitude for increasing sales. Where a business is being built up, it needs more advertising in proportion to sales than when it is thoroughly established. The plan of assessing future sales instead of past sales, is therefore coming into wide vogue.

Thus, the opinions of many advertising men of note are in favor of the method of basing the advertising appropriation on a certain percentage of the anticipated sales and consider it to be the most practical way. But in this case, a concern must not base its appropriation on last year's sales, and where more sales effort is required, the percentage of appropriation to sales must be increased to the extent deemed advisable or necessary.

Method No. 2—Appropriations Based on a Certain Unit of the Product. Many firms take a unit of their product as a basis for figuring all expenditures. They budget everything on the unit basis. Salesmen are allowed so much for salary, so much for traveling expenses, etc., per unit. Even the profits are figured in the same manner. This method is suited particularly to those lines where the money value is not known, until the returns are received from the trade such as when goods are sold through auction markets.

The unit plan of calculation is used more frequently in association campaigns than anywhere else. The campaign of the California Fruit Growers is based on an assessment of 1½c per box of oranges, and 7c per box of lemons. The Metal Lath Association's assessments are based on the number of square yards of metal lath sold by its members. The coffee campaign fund is a result of a levy on each bag of coffee. Lumber Association assess on so much per thousand feet. The National Canners' Association campaign is financed on a basis of not to exceed 2c per case for the inspection service and 3c per case for advertising. Numerous other illustrations could be cited.

Method No. 3—Using Money Available for Advertising as an Investment in Future Sales. A prominent business executive stated his views on calculating advertising cost as follows: "The real way to decrease your advertising expense is to increase it. If the law of diminishing returns is observed, money cannot be spent in advertising. It brings back enough sales to pay for itself and a profit besides. However, one cannot reasonably expect the advertising to be profitable the first year or the second or perhaps even the third. He must have courage to go on, building up a good will investment with the assurance that some day it will begin to pay back a handsome profit.

Many business men must of necessity handle their advertising in this manner. They may have no definite appropriation at all, but put all the money available into advertising, just as they might put their reserves into guilt-edged securities.

Method No. 4—Budget System. Where a budget system is being used, advertising is of course included in the budget. Some concerns budget a year ahead, some six months, and some for even shorter periods, depending upon the needs of their business.

It makes little difference whether the advertising appropriation is based upon a percentage of total sales, or whether it is a definite percentage of each unit sold, so long as the standard is maintained.

As applied to advertising, the budget system is satisfactory or unsatisfactory, depending on whether or not the sum set aside for advertising is adequate or inadequate. Since budgets, as a rule, are somewhat narrowly and often arbitrarily fixed, the amount alloted to the advertising department or advertising manager is likely to be too small for the work to be done. An illustration of this is a concern that annually budgets $100,000 a year for advertising. It has appropriated this sum regularly for the past 25 years. When this custom was started, $100,000 a year was a very generous appropriation. At that time, it was a fair percentage of the company's sales. In recent years, however, what with space, paper, printing, engravings, salaries and all the other accessories of advertising costing more money, $100,000 a year does not give the organization the advertising it should have. The appropriation is, therefore, ridiculously out of proportion to the sales.

On the other hand, there is much to be said in favor of the budget plan. It controls reckless expenditures and permits careful financing. It allows the treasurer of the company to plan ahead for all the financial necessities of the business. And if the advertising budget is unfailingly furnished each year, it provides advertising continuity, which is often lacking where the appropriation that is available depends on the state of the bank account. Some concerns are overgenerous with their advertising in flush times, and cut the advertising down to almost nil, when business conditions are adverse. Obviously, the concern with a regular appropriation, even though it is small, will get further in the long run than the concern that makes

a splurge one year and then hides its light under a bushel basket the next year.

Along this line, an official of one of the largest corporations remarked as follows: "During periods of business depression, the financial ends of the business are almost always in the saddle, and their necessities are greater than the necessities of the advertising end. In our own company, I believe we are all sold on the effectiveness of advertising. Our advertising appropriation, therefore, results in a compromise. At such times, I do not think it good business to overspend, as this often results in cramping other necessary expenditures. On the other hand, we try to keep a reasonable advertising appropriation going, no matter what the times are."

Method No. 5—Advertising to Get a Certain Number of New Customers or Dealers. New advertisers almost invariably ask this question: What percentage of my total sales should be spent for advertising? There are conditions which more or less control the appropriation; and they vary for each individual business. So that it is impossible to apply a mathematical formula and say offhand the appropriation should be 5 per cent, or 10 per cent, etc.

But there are other ways of determining. Figure how much new business the market should be made to yield in any given period. Find out how much of this business the concern should attempt to secure with the capacity of its factory and sales force as limitations. Estimate conservatively and fix this possible sales volume as the quota for the given period of time.

Next determine how much of the increase can be obtained from your present customers, and how many new accounts you have to open. With these facts and figures before him, a reliable advertising agent can tell how much it will cost to:

(1) Create a consumer demand.

(2) Arouse a dealer interest; that will be sufficient to assure the necessary increase from old customers and the necessary number of new accounts.

In this way, the appropriation is arrived at, and results from selling effort cancel advertising costs at every step.

Method No. 6—Advertising to Buy Inquiries or Direct Sales. This is the type of advertising used by mail-order houses, department stores and by others whose advertising must pay its way as it goes along. Their appropriation is determined with this in view. They advertise for definite, immediate results. In the mail-order business, particularly, advertising results are computed according to the law of averages, and have been reduced to almost a mathematical certainty. In this line, therefore, the appropriation largely depends on how many inquiries or sales the advertiser thinks he can profitably buy.

Method No. 7—Appropriating Enough Money to Put Over a Specific Advertising Task. This may not be a method so much as it is the result of a method. A great many advertising men hold that the only thing they are interested in about the advertising appropriation, is that it be large enough to accomplish some advertising job.

More advertising fails because of insufficient appropriation than for any single reason. Thus, for example, the campaign of a cigar manufacturer was discovered in the act of slipping. Territorial advertising appropriations were assigned on a basis of the present sales in a territory. This worked out well in those sections where the sales were large, but it allowed a totally inadequate appropriation for those districts where sales were small. In one city of one half million people, for illustration, this basis of operation permitted the manufacturer to run only a ten inch single column advertisement twice a week in but one newspaper. Since other cigars were strongly entrenched in the market, this little volume of advertising made no impression. Quadruple the appropriation, advised the advertising agency. This was done, and immediately the sale of the underdog took a handsome spurt. The agency man handling this account expressed himself as follows: When you run into a deadlock of this kind, disregard present sales and bet your advertising money on potential sales. If you make the bet large enough, you will win out every time.

Method No. 8—Appropriating a Percentage of the Previous Year's Profits or Levying on Capital. A number of concerns, instead of putting their profits into dividends or into the surplus account, put the money back into the development of the business. The profits are budgeted and turned over to various departments of the business. A certain amount of it goes for additions to the plant. Some of it is used for an increase in sales promotion, some for advertising, and so on. In a few cases, this assignment of profits to the advertising account is made on some arbitrary basis such as all the profits over 25%.

The following is quoted from Lord Leverhulme:

"The best reserve fund of any business is to be found in the good-will of that business. Many board directors devote their surplus profits to 'building up a reserve fund,' which fund is generally invested in what again are called 'gilt-edged' securities. These same directors are then kept busy for many years afterwards to write down out of further surplus profits, the cost price of these same gilt-edged securities to falling market values. Should the business have to meet and overcome difficulties, or have to face frenzied competition, and the directors decide that their policy ought to be to draw somewhat upon these 'reserves,' they find they cannot realize on them without serious injury and loss of the confidence of other stockholders in the reputation and standing of the business or in serious words, serious loss of good will.

"These reserves are mere window dressings. They

cannot be described as reserves in any sense of the word, and to do so is an act of self-deception.

"There are no reserves of strength, and even to reduce them in amount, in order to employ these reserve funds in meeting any emergency, would be a suicidal policy. In these circumstances, directors find out that they must choose between being killed by competition, or dying by suicide, and that there is no alternative.

"Now, I strongly hold that the best investment for surplus profits is to expend them on judicious advertising, wisely and carefully planned, and executed with originality and forcefulness. These same surplus profits invested wisely in advertising then become a real 'gilt-edge' security, and a solid reserve of strength to meet days of difficulty, and to overcome quiety but irresistibly and surely the most frenzied of competition, and the business thus provided with reserve strength stands foursquare to meet and overcome every attack."

Where a business is well established and the annual profits substantial, the profit plan works out satisfactorily. On the other hand, when a new concern is trying to establish itself and where profits are likely to be uncertain for a few years, this plan for raising the appropriation would not do at all.

To get an appropriation, very often a new company has to levy on its capital. Some concerns need advertising investments and consider them as capital investments. Many times advertisers must advertise to a greater extent than the immediate market justifies. To get the money they have to use their capital.

Method No. 9—Appropriations That Are Based on What Competitors Are Doing. This may not appear to be a scientific way of building an appropriation, but it is a method that many business executives follow, and must therefore be recognized in this article. It is generally known that one of the quickest ways to wake up an industry (advertisingly) is to get some representative concern in it to advertise. Usually, it isn't long before some of the others will follow suit. Of course, this is understandable. When a concern advertises aggressively, its competitors must not only compete with it, but also with its advertising. Unless they get their own advertising going, to offset this aggressive influence of the opposition, they will be doubly handicapped.

The strength of the competition must always be taken into consideration in planning an advertising campaign. Nearly always it is a factor that must be counted on. It is inadvisable, though, to let competition decide the whole campaign. Where this is done, the advertising of an industry is a follow-the-leader game. The trouble is that all of it is likely to climb up to a certain point, and then stick there, regardless of the advertising needs of the companies involved.

Method No. 10—Building Up an Advertising Reserve (American Sugar Refining Co). The American Sugar Refining Company, in 1917, set aside an appropriation of $1,000,000 for trade-mark advertising. The report of President Babst, issued at that time, explained this reserve more in detail. The statement read: It makes the company a pioneer in setting up a reserve to secure permanency of an advertising policy which, in the end, will bring the company closer to the consuming public.

This does not mean that the money has been put into a permanent fund, the interest on which is to be used for advertising. It is merely set aside, as a reserve, from the profits of the concern, and is to be applied solely to advertising. Neither does it imply that the million dollars necessarily will be used up this year. It may or may not. If any is left over, it will remain in the reserve and will help to swell the next appropriation. On the other hand, none of it may be used, for advertising appropriations may come from current earnings in the usual way.

In theory, if the anticipated sales in any given year bring the percentage of the appropriation to sales below the amount set for that year, the advertiser should put the difference into a reserve fund to be used for advertising during years which will require more sales effort.

Method No. 11—This is an attempt to establish a relationship between an annual advertising appropriation and the value of its good will. The theory of this plan is that since advertising builds good will and preserves good will which already exists, why not carry the idea further and take out an insurance policy in the form of advertising as a means of protecting the concern's good will at its appraised value? (This is a plan formulated by Printer's Ink in Dec. 1920.) Every concern protects its assets against fire, and in the same manner, why not protect good will against depreciation by insurance in the form of advertising?

This plan, however, has these objections:

1—It is difficult to find the value of any given concern's good will. From the accounting viewpoint, there is a good deal of prejudice against including good will on the balance sheet, and comparatively few concerns include their good will in the balance sheet.

2—Another objection is that for the average business, the application of the insurance idea with any figure which all parties will accept as a reasonable good will valuation, results in an appropriation so small that the insurance desired cannot be purchased through advertising. However, in the case of a large corporation whose recognized good will value runs over ten million dollars, advertising insurance could be purchased at a low rate of premium. This objection would not, therefore, apply to concerns in this class.

The above methods of calculating advertising appropriations do not cover all the minor and special methods used in individual cases, and the classifications made by the author are only arbitrary.

The Degree of Hydration

By HARRY WILLIAMSON
Class Instructor, Champion Fibre Co., Canton, N. C.

This article by Mr. Williamson was presented at the eighth annual meeting of the American Pulp and Paper Mill Superintendents Association, having been prepared specially for that purpose. It is being featured in this issue of The Paper Industry, thereby taking the place of the regular installment on Lessons in Paper Making which will be resumed in the July issue with Lesson Twelve.

THERE is a trite saying "that we give so that we may receive" and my acceptance of the honor of delivering a paper before this meeting was partly governed by the selfish thought that I would gain more from the ensuing discussion than I can possibly hope to give you.

It is not the purpose of this paper to deal with the question of hydration of the fiber from the purely technical point of view, but rather with the practical results of hydration, or lack of it, in the running of the Fourdrinier machine.

In discussing the action of the fiber on the wire during the formation into a homogeneous sheet of paper, it is necessary to keep clearly in mind the distinction between **water** as a suspending or **free water**, and the **water of hydration**; that is, the water which by beating and jordaning has become a physical component part of the fiber.

The former is the medium by which we float and suspend the separate fibers until, by the slice velocity and shake action, the fibers are woven together. We desire to retain such water only until it has completed its service, and in the course of this service we want it to drain from the fiber and through the wire gradually, so that when the slice velocity is expended, the fibers shall be woven together in a sheet with an even caliper and density of formation and traveling at the same horizontal speed as the wire.

The latter, **water of hydration**, as a physical component of the fiber, helps retard the drainage of the free water and thereby aids in keeping the fibers in suspension and under the influence of the shake for a longer period. It also offers resistance to the suction pumps which results in atmospheric pressure on the surface of the sheet, but, it is **not** removable by drainage. It is only removable by suction, mechanical pressure applied to the presses and press felts, or by the temperature of the dryers. A percentage of it, carying from 3% to 6%, is a saleable product and a necessary and desirable component of the finished sheet of paper.

Let us briefly review the term, Hydration. It is in itself somewhat erroneous. Webster states that to hydrate, is to form a chemical compound with water. James Strachan, in a brilliant paper submitted before the British Technical Section at Manchester in 1926, contends the combination is physical rather than chemical, and in this contention he is fully supported by that very able papermaker R. H. Clapperton. This writer in a recent non-technical paper prepared for the use of machine room operatives, ventured to describe hydration as the "forming of a colloidal jell round the core of each fiber." Hydration can be developed to some extent by the prolonged saturation of fiber by water. In papermaking it is developed during the beating and jordaning by the constant forcing of water through and into the cells of the fibers.

In the process of **fibrillating** the fibers, the fibrillae produced present an increased area attracting water to the many added surfaces. This water is charged with the finer particles of cellulose, themselves heavily hydrated. The cohesive affinity of these hydrated finer particles to the fibrillae cannot be defined as hydration of the core of the fiber proper; a distinction in terms for the two conditions is necessary. The latter condition may be adequately described as **the loading of fibrillae with water charged cellulose.**

The development of a state of hydration in fiber costs money in power. The removal of excess hydration in the fiber costs money in felt wear and dryer steam.

To what degree then is the development of a state of hydration justified? What degree of hydration is necessary to the successful operation of the Fourdrinier machine? Does the development of hydration, **as such,** represent the strength of the fiber?

Sheet Formation Factors

Permit me to deal with the operation of the machine first. Perhaps if we consider the absolutely essential factors necessary to the formation of the sheet on the wire and its subsequent successful running over the machine, we may be better able to find a satisfactory answer to our questions.

1—We must have a mixed volume of stock and water **behind** the slice, the density of which will ensure the **adequate separation** of the bundles of fibers into individual units.

2—The **flow weight** of this volume at the slice lip must be equal to the speed of the wire.

3—The volume delivered **from** the slice lip to the wire must be sufficient to maintain the **fibers in suspension** until a homogeneous sheet has been formed.

4—The formation of the sheet presented to the suc-

tion boxes must be of sufficient **density** to obtain the necessary atmospheric pressure on the surface of the sheet.

We will take these essential factors in the order named and deal with the relationship of hydration to each of them.

Density of Mixed Volume

The density of the mixed volume delivered from the screens to the head box is of vital importance to the formation. Behind the slice, we desire the individual separation of the fibers in the suspending medium water. From the instant the mixed volume is delivered to the wire, our whole efforts are concentrated on weaving and interlocking those separate fibers together. On the one side **separation;** on the other side **unity.** The greater the separation, the better the opportunity to obtain **even unity.**

If the mixed volume behind the slice is too heavy, the fibers tend to coagulate into bundles and even the most vigorous shake applied to the wire will not cause separation and subsequent individual interlocking of fibers. The result is a lumpy formation offering uneven resistance to the temperature of the dryers. Such a sheet will show damp black spots on the surface with very little calendering.

The separation of the fibers, commenced in the beating, must be finally achieved in the travel of the mixed volume through the sand traps, screens, and head box. This is made possible by the use of a sufficient volume of **free water.**

The greater the hydration of the fiber while maintaining the same machine speed, the **less** volume of water as a suspending medium used, therefore, the heavier the density of the mixed volume delivered from the head box to the slice.

To such extremes do we sometimes carry the hydration of the fiber and consequent curtailment of free water in an effort to increase the Pop Test, the whole action of the mixed volume in its travel to the slice is sluggish. This sluggishness not only militates against separation of the fibers, it actually tends to float them together, forming lumps resulting in breaks.

On the heavier papers, run at a slower speed and consequently a heavier density, due to basis weight and speed rather than hydration, variation in weight is many times directly traceable to the forming and releasing of pockets of sluggish stock through the delivery system. Hence, the necessity on such papers to install extra baffle boards and dams which will permit the use of more free water for separation purposes through the delivery system without being compelled to use the flow weight of this extra water at the slice.

Excessive hydration of the fiber as such, in relation to this factor, **adequate separation of the fibers into individual units,** is a liability rather than an asset.

Flow Weight and Volume Delivery

Our next two factors, the flow weight of the volume behind the slice, and the volume delivered to the wire as distinct from its flow weight, can be linked together in discussing the relationship of hydration to them.

A sufficient volume must be kept **behind** the slice to maintain a delivery speed equal to the speed of the wire. A sufficient volume must be delivered **from** the slice to maintain the fibers in suspension long enough to get the full benefit of the shake.

These two factors are the most important in the operation of the Fourdrinier machine, and their relative value, each to the other is determined and variable in ratio to the degree of hydration developed in the fiber. It cannot be stressed too strongly that the sheet that leaves the couch roll with its perfections and imperfections is fully representative of the quality of the final product.

By juggling press weights, dryer temperature, and calendering, we may bring out the perfections and mitigate to a certain extent the imperfections, but in the handling of these mechanical units we have a very limited range of possible achievement. The preparation of the fiber is a great deal more flexible and has a far greater range of possibilities. As far as the practical operation of the machine is concerned, the degree of hydration developed in the fiber in this preparation has the greatest bearing on these two factors.

"Stock Slow, Slices Low," is the machine tenders' slogan. Flow speed is determined by the depth of head carried and the control of the outlet as represented by the space between the slice lip and the apron board. As the hydration of the fiber is increased, free water is shut off, and the slice must, therefore, be lowered to maintain the depth of head carried.

The net result is heavier density forced through a smaller opening. A smaller total volume delivered to the wire. The same volume of fiber, a lesser volume of the suspending medium water. In the fiber has been developed a condition, hydration, which will help retard the drainage of the comparatively small volume of suspending water.

The action of the fibers in such a condition under the influence of the shake, is **vibratory** rather than free floating. It is by the cohesiveness of the colloidal jell rather than the interlocking of fibrillae that formation will be accomplished.

By the resistance of the colloidal jell, the heaviest fibers will be prevented from settling to the wire, thus tending to improve the smoothness of the wire side of the sheet. By this same resistance the drainage of free water is slow, therefore, while the fibers have at no time since their delivery to the wire floated free, they maintain their vibratory action right up to the suction box.

Because the fibers are not actually floating as freely as would be possible were a greater volume of

free water to be used, their area of movement after delivery from the slice is extremely limited. This is at once an advantage and a disadvantage.

Where the free floating of the fibers while passing over the area of greatest shake action is excessively curtailed, there is a pronounced tendency to form those evils; later developed by uneven shrinkage on the presses and dryers, and whose inspection under these conditions is traceable to an uneven moisture content in the shoot during its formation on the wire, **cockling, wet streaks and color streaks.**

On the other hand, where the fibers are floating **too freely,** owing to the use of a much greater volume of free water, they are the harder to direct and control. From this cause, while the fibers are most certainly woven and interlocked, the formation will be wild and the distribution of strength will be patchy. The violence of the rush from the slice would turn many of the finer fibers on end thus giving the sheet an unfelted appearance.

In this important phase, this travel from the slice to the suction box, this use of the making surface of the wire, **hydration, as such,** used with discretion, is necessary to the successful operation of the machine.

From the two alternatives submitted, a **lesser** volume of free water with a fiber of greater hydration, or a **greater** volume of free water and a fiber of lesser hydration, we can use the advantages of both and discard the disadvantages.

We want the splendid weaving and interlocking results of free floating fiber without losing our control of the volume. We want the slower drainage of the more hydrated fiber giving us the benefit of the **vibratory cohesiveness** of the colloidal jell without being compelled to overcome its resistance to the removal of its excess water content.

A delivery from the slice of a mixed volume would keep the fibers in a gradually decreasing suspension for the first six feet of the making surface of the wire, and from this point to the suction box be sufficiently hydrated to be vibratory under the diminishing influence of the shake, is the ideal condition to be aimed at for the successful control of these, our two most important factors.

Our last essential factor, that of obtaining sufficient **density** of formation to offer sufficient resistance to the suction pumps to obtain the necessary atmospheric pressure on the surface of the sheet, is to be decided by **what will this density be composed of?** Will it be a closely woven formation of fibers interlocked by fibrillae with their "water charged fiber particles of cellulose" clinging to their surfaces, or will it be by the greater proportion of the colloidal jell of hydration in the core of the fiber?

Either condition will give us the required density, or as we term it in the machine room, the necessary inches of vacuum. While the vacuum as recorded by the gauge may very possibly be exactly the same in each method of obtaining this **resistance density,** the operation of the machine is markedly of a different character for either condition.

Perhaps in the operation of the dandy we have our best guide. The function of the dandy is to close and compact the woven fibers together by mechanical pressure. In performing this duty, the dandy brings the finer particles of the cellulose to the surface. With either of the conditions of formation we are dealing with, there will be enough free water carried to the first suction boxes, to lubricate them and run the paper wet to the dandy.

If the **density** is of the interlocking fibrillae condition with lesser hydration of the fiber proper, this free water presented to the dandy will assist in closing the sheet and is disposed of quite easily through the sheet, wire and dandy mesh.

If however, the **density** is of the greater proportion of the colloidal nature, that is excessive hydration of the fibers, the resistance to the passage of the water is much greater. The results are seen in the breaks from **wet dandy marks,** which are a disruption of the fibers by water under mechanical pressure. Under these circumstances it becomes necessary to suck the sheet much harder before it passes under the dandy, and such a sheet will show much speckier than a freer sheet run wet under the dandy.

We have, therefore, the key word **density** at both ends of the making surface of the wire to guide us. Behind the slice, **density of the mixed volume;** at the dandy, **the nature of the density of formation.** In the operation of the machine, hydration is a delicate tool we can use to advantage, according to the grade of paper to be made. Used with discrimination, it is an aid to caliper, formation and finish. It helps prevent cockling, yet, used in excess it is the primary cause of cockling.

I think it will be generally conceded, that hydration in excess is a liability to the operation of the paper machine. If this conclusion be correct, there is only one permissible reason for the excess development of hydration and that is if this development gives added strength to the fiber.

Hydration vs. Fibrillation in Strength Test

We are, therefore, confronted with the following problem:—

Is the development of hydration, as such, necessary to the production of strength in the fiber, or is the **fibrillation** of the fiber representative of the strength and **hydration incidental to the production of fibrillae** and not a necessity to the development of strength in the fiber?

If we believe the former, then the machine speed, head box, aprons, and slice adjustment, must be arranged to permit the use of sufficient water to give adequate separation of fiber and yet allow for the removal of excess water which has become a physical component part of the fiber.

If we incline to the latter, then in the cooking of our

pulp, we must endeavor to produce a fiber which will enable the beaters and the jordans to perform their duties of **separation, softening** and **fibrillation** of the fibers with **only the desirable degree of hydration.**

The preparation of sulphate pulp for kraft papers is an outstanding example of this latter condition, and it must be remembered that kraft is the strongest of our wood papers.

A safe kraft pulp with a high yield from the digesters and a low screening of chips usually means a fiber susceptible to hydration to the almost total impregnation of the fiber by water before sufficient **fibrillation** has been achieved.

The resultant sheet shows a close formation, is considerably harder to dry, shows a strong tendency to cockling when run at high speed and has a low pop test. It has been rightfully said that kraft paper is made in the digester. By accepting a lower digester yield and a greater amount of chip screenings, which can be suitably used up, a fiber is produced which permits the beaters and jordans to accomplish **fibrillation** with lesser hydration.

In closing, I would like to leave this thought for your consideration. Strength is the interlocking and weaving of the fibers together by the mechanical features of the machine, while the fibers are in suspension in water.

This is made possible by the development of fibrillae. The cohesive affinity of the **water charged finer particles of cellulose** to the increased surfaces of the developed fibrillae is **incidental** to the resultant strength and not the cause.

Perhaps if we adopt the slogan **fibrillation before hydration,** we will improve our results.

The degree of hydration is that degree which is incidental to the fibrillation of the fiber.

A Method of Distinguishing Between Pasted and Unpasted Boards

By ALFRED TINGLE
Chemical Laboratory, Department of Customs and Excise, Ottawa, Ont., Canada.

THE methods commonly used when deciding whether a sample of board is built up by pasting, or by the natural adhesion of freshly-made sheets, leaves much to the imagination and personal judgment of the operator.

To make a hot-water extract of a small sample and test this for starch or for alkali (the latter as an indication of sodium silicate adhesive) is a usual step, but quite inconclusive, since starch or sodium silicate may have been added in the beater and some furnishes — particularly straw — will carry enough lime to give a decidedly alkaline reaction.

An even more common, but very fallible procedure is to soak the sample in water till it splits into its constituent layers, examine the freshly-exposed surfaces, and judge the ease with which they have separated. In certain cases, a positive verdict in favor of pasting can be given with certainty, as when the inner surface is found to bear a thick and palpable layer of starch paste, but a wrong decision may be due to bad luck in manipulation, or lack of judgment on the part of the observer.

How unsatisfactory the results obtained may be, is best appreciated by those who have tried the experiment of submitting a doubtful sample to a number of independent "experts," and comparing the opinion given. The outcome reminds one rather of a municipal election than of an analytical report. The writer has found the method described below more certain than any other.

Testing for Sodium Silicate Adhesive

While the use of a low power compound microscope, such as may be found in the laboratory of any paper mill, is here suggested, quite satisfactory results can often be got by the use of a good hand lens, especially when dealing with the thicker boards.

A rectangular slip, measuring about 2-in. x ¾-in. should be cut from the sample. The narrow edge, which is the part destined for examination, should be freshly and sharply cut, as straight as possible. The slip should be bent into the form of a capital "L," one limb being decidedly shorter—say ½-in. or less in length.

The longer limb can be laid flat on the stage of a microscope, and held firmly enough by a single stage clip, while the clean cut edge of the short limb, after appropriate staining, is brought into the field of view under an objective of about 1 inch focal length, the light being arranged for direct illumination of the opaque surface.

If a sodium silicate adhesive is being looked for, the edge under examination is well moistened with a solution containing 0.5 per cent phenolphthalein in alcohol, allowed to dry, moistened with distilled water, and examined promptly. If two sheets have been pasted together with a sodium silicate adhesive, a deep red line, running the length of the cut edge, will mark the junction of the pasted surfaces. The breadth of the line will vary somewhat, according to the nature of the board.

Finding Starch Adhesive

To detect a starch-containing adhesive, the stain used is a solution of iodine and potassium iodide in water. Blue-black lines develop if any such paste has been used, each line corresponding to a surface of union. Care must be taken that the iodine solution shall not be too strong, or its brown color will obscure any blue line. A very convenient strength to use has been found to be about 0.04 gramme of iodine in 100 cc. of stain. As a very ordinary iodine-potassium iodide stain for use in paper fiber examination contains 1.3 grammes of iodine in 100 cc., it

is easy to make the "paste stain" by diluting the "fiber stain" with 30 times its volume of water.

It is common to find in some of the white pasted boards that the fibers stain a faint blue, due either to the presence of starch or hydrated celluloses, but it is not possible to confuse such staining with the narrow continuous lines of dark blue which mark the pasted surfaces.

The presence of sodium silicate or other alkaline matter may likewise cause a faint coloration of fiber when the phenolphthalein stain is being used, but this also can cause no confusion, and is indeed seldom observed, since the red coloring matter is very transparent.

In certain critical cases, it may be well to strengthen the weight of evidence by examining a thin transverse section of stained board by transmitted light. The technique of paraffin embedding and the use of the microtome will be familiar enough to chemists who have had some training in biology, but cannot suitably be described here for those who lack that advantage. It may not be entirely out of place to remark, however, that in the writer's opinion, considerable information about the properties of paper and papermaking materials would be gained were more attention paid to the examination of paper in thin sections, instead of attention being confined, as at present, to the study of teased samples.

Care and Study of Rubber Rolls

Use of Testing Instruments to Maintain Uniform Pressing

SUCCESSFUL paper machine operation is based on correctness of fundamentals. There is nothing that can be done on the fourdrinier part to overcome incorrect stock preparation. There is nothing which can be done in the press part which can overcome incorrect formation on the fourdrinier part. There is nothing which can be done in the dryers or in the calenders which will overcome the effect of poor formation and pressing.

Poorly formed paper, especially where there are streaks, will carry these streaks onto the reels. Poorly pressed paper will carry streaks onto the reels. Paper which has streaks when it comes off of the paper machine will supercalender poorly, and if it is coated, it will coat in streaks. Streaky board means uneven caliper board, and this gives trouble if it is laminated and bothers in the box making machines.

Fundamental faults in paper making cannot be glossed over to leave an apparently perfect product. This might be done with paint on castings. There is no way of glossing over flaws in paper. Even the printer has difficulty in putting ink on streaky paper.

It is possible that on some of the cheaper grades of paper, streaky drying is not a deterrent to sales. On these grades, however, streaky drying is expensive, as streaky paper must be overdried; that is, the wettest part must be dried out and the remainder overdried. This is expensive business, as any papermaker who meters the steam to his dryers will tell you.

Some fundamental faults in paper originate on the fourdrinier—or the cylinders. Others begin only in the press part. The papermaker who is having trouble in any part of his machine will do well to assure himself that his pressing is all it should be before he makes adjustments elsewhere. A case in point is cited:

In a newsprint mill there is a new superintendent. The new man was hired because the product of the mill was rapidly becoming unsalable. It would not run over the printing presses because of calender cuts. On the new superintendent's first visit to the mill he walked down the machine room and saw rolls raised up in the stack, and fantastic combinations of levers and wedges in use to try to stop the calender cuts. He went down to the wet end and looked at the pressing, and there seemed to be something wrong. He called for the rubber roll records and there were none. At the first week-end, the rubber rolls were taken out, one after another, and measured for crown and tested for plasticity. The superintendent made changes in crown and made notes for changes in plasticity when new rolls were to be ordered. Now the entire calender stack is being used, and there are no more calender cuts.

After formation, the pressing is the chief factor in the production of paper of good quality—whatever the grade. In the pressing, the felts and the rubber rolls are of equal importance, but neither should be neglected. In order to secure the best service from well chosen felts, rubber roll densities should be equally well chosen, and a crown selected for each roll which will give the best results. While there are rules for the initial selection of rubber roll densities and crown, as given in recent articles by Harry Williamson (in THE PAPER INDUSTRY), and there is the experience of paper manufacturers on which to go, the whole thing, as Williamson points out in many of his articles, depends on the character of stock, the class of paper being made, the size of the machine and the speed at which it is being run and nothing but study of experience will give the best result.

The progressive papermakers today are leaving as little as possible to rule of thumb judgment in this connection. The essential equipment for study of the rubber roll situation in any paper mill consists

of an instrument to test hardness, a steel tape, and a regular place for the recording of data secured with the help of these two.

There are two instruments for testing hardness in regular use. The Pusey and Jones plastometer, made by the Pusey and Jones Corporation, Wilmington, Del., is one of the standard instruments in Canada and the United States for measuring the density of rubber press roll covers. This instrument provides means for determining how far a ball pointed shaft when weighted with a one kilogram weight, will sink into the rubber. The Pusey and Jones instrument is illustrated and complete rules for its use are given.

The Plastometer

For testing with the Pusey and Jones plastometer, there is given in the box of the instrument a very complete and elaborate set of directions. These

Courtesy Pusey & Jones Corp.
Applying Plastometer to Rubber Roll

should, of course, be studied with care by the workman who is to use the instrument. For the purpose of this article, the following rules cover the ground and they are approved by the Pusey and Jones official bulletin, "The Super-Calender."

1—Set the gauge at O.
2—Lower gauge and ball until ball touches the rubber, and
3—Keep on until the pointer makes three revolutions.
4—Lower kilogram weight fully, as shown by about a $\frac{1}{16}$" gap under its shoulder.
5—Allow instrument to remain in this position for one minute before taking the reading in hundredths of a millimeter.

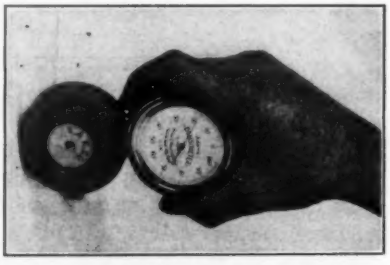
The Densimeter

The other instrument is the Adams Densimeter made by Stowe and Woodward, Newton Upper Falls, Mass. It is designed for the same purpose—to measure how far a ball pointed shaft will sink into the rubber under the constant pressure supplied by design of the instrument. The figure given by the Stowe and Woodward instrument is half that of the figure given by the Pusey and Jones instrument with the one-eighth inch diameter ball point. The Stowe and Woodward instrument is illustrated and complete rules for its use are given.

The following instructions are given for the use of the densimeter: press the ball against the rubber flush with the flat metal surface. By slightly rocking the densimeter, the lowest reading shows when the metal surface is just tangent to the rubber surface, and the reading is then correct. It will be noticed that the pointer travels down the scale as the point enters the rubber, stopping at the point which indicates its densimeter. It will read zero when pressed against a perfectly flat steel or glass surface, as there will be then no penetration of the point.

Courtesy Stowe & Woodward Co.
The Densimeter

The reading shows the number of 50ths of a millimeter that the ball point penetrates the rubber, and this is called the density or densimeter of the rubber. The point of the densimeter is so small and the instrument so sensitive that the reading may be affected by the condition of the surface of the rubber being tested. To get uniform and accurate reading, the rubber surface should be smooth and level. If the point happens to press against a small particle of grit in the rubber, the reading will be too low. If the point happens to press against a small particle of grit in the rubber, the reading will be too low. If the surface is rough or too level the reading will be too high. When testing a sample, the surface of which is not level, it is advisable to unscrew and remove the knurled disc, leaving a disc of smaller area.



Courtesy Stowe & Woodward Co.
Applying Densimeter to Rubber Roll

Many large paper mills use both instruments. The plastometer is considered the master instrument and kept in the laboratory, the roll grinder room or the inspection department. The densimeter may be used on a rubber roll in place on the machine by the superintendent or man in charge of the paper machine.

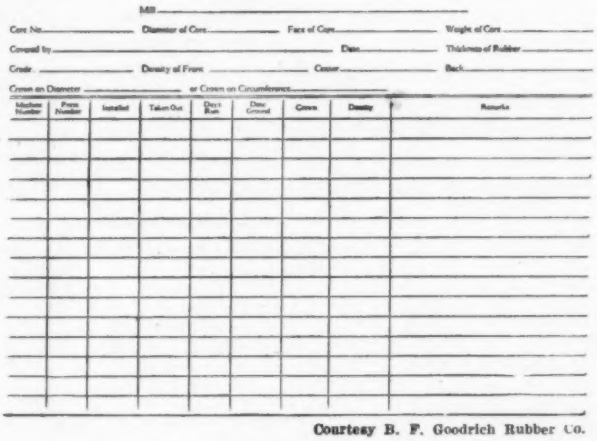
The steel tape is used for the measurement of crown. Crown in a rubber roll is the amount the cir-

cumference of a roll, measured at the point midway between its shoulders, exceeds the circumference of the roll at the shoulder. This is taken by measuring carefully with the steel tape the circumference at the center of the roll and again at each end.

Recording Rubber Roll Tests

Given these necessary instruments and the general rule that rubber roll conditions and their effect on the drying of paper and the life of felts must be carefully studied in every paper mill, there must also be provided a place for recording this information, so that it may be studied as one roll after another is used. A concise and comprehensive form is illustrated herewith.

One of these pages should be used for each rubber roll while it has the same covering. A new page should be taken for a new covering on the same core.



Mill _____

Core No. _____ Diameter of Core _____ Face of Core _____ Weight of Core _____

Covered by _____ Date _____ Thickness of Rubber _____

Grade _____ Density of Front _____ Center _____ Back _____

Crown on Diameter _____ or Crown on Circumference _____

Machine Number	Press Number	Installed	Taken Out	Days Run	Date Ground	Crown	Density	Remarks

Courtesy B. F. Goodrich Rubber Co.

Record blank for rubber rolls

The essential information is comprised in this form, although more space might profitably be used for the recording of the density each time the roll is reground. On a roll meant for a machine of up to say one hundred twenty inches, five density tests across the roll would be sufficient. That is at each end, the center and midway between the end and center on each side. When rubber rolls get to be double the width given above, seven or even nine tests might be made across the roll.

Papermakers today insist that the rubber densities remain the same as the rubber wears away. More particularly, they insist that the densities across the width of the roll be the same. It is this uniformity of density which gives the freedom from wet streaks and uneven caliper which makes for savings. Study of the densities and their effect on water removal and on the felts will result in the choice of these densities which are the best for the particular job.

A press roll that has only a slight variation in density will give a decided improvement in paper machine operation. The damp streaks in the sheet will be eliminated. With a press roll having a density variation, the top roll rides on the hard spots causing damp streaks over the softer rubber. In the case of fine printing and lithographing papers, this results, too, in thin streaks in the paper. This causes much trouble on the printing and lithographing presses, particularly when different colored inks are used.

In high speed operations, especially on news, a press roll with only slight variation in density will help greatly in the making of the reels. There will be more evenly dried paper, less broke at the dry and improved reels. Improved reels make for better winding, better starts and harder wound rolls—essentials for rolls to be used on high speed printing presses.

Studying Crown Effects

This same thought of studying the record applies to crown as well. Excessive crowning is very detrimental to the covers of the rubber rolls. Where excess crown is carried, extra weights must be carried on the levers to dry the edges of the sheet. No soft stock will stand up under this kind of service—nor will any other stock with good results.

There are differing opinions as to the initial determination of the crown for a rubber roll. One rubber roll manufacturer says that the crown can be approximated by calculating the deflection in the lower roll. This, however, is only an approximation and on starting up the machine the following procedure should be followed: after the machine is started up, the paper across the width of the machine just in front of the press should be tested, nominal running speed being maintained and nominal weights carried. This test is a moisture test. The crown should then be adjusted in the light of these tests.

Another opinion is that the rule of thumb method is the only way by which the initial crown can be determined. This really means that many papermakers determine changes in the crown simply by judgment, taking into consideration the condition of the sheet when it arrives at the reel and the amount of water running away from the nip in back of the roll.

In keeping records it may be well to note the length of time the roll has been in store, either after its receipt from the factory or after being ground and put away as a spare roll. Parts of the mill that are hot, dry or exposed to too much sunlight should be avoided for storage of rubber rolls. Sometimes rolls which have been kept too long in storage acquire an oxidized film on the surface, and when such a condition occurs they should be put back in the grinder for a brief run before being put on the machine.

Rubber rolls should be changed and ground promptly when their conditions indicates the necessity. Each rubber roll in the mill—especially on fast speed jobs—should be examined once a week toward the end of the week, and an effort should be made to

take out and grind those which are beginning to corrugate. A corrugated roll does not give efficient service. It is much better to grind it at once when the corrugating starts. If this trouble seems to be occurring with undesirable frequency, a change of the density on the next covering or a change of the crown—if compatible with other conditions—may bring about an improvement.

However, none of these matters can be effectively checked without instruments and records. The instruments necessary are inexpensive, the methods of keeping records simple. With the plastometer, the tape and the record book or sheets at hand, the crown, and density of every rubber roll should be checked on the receipt of the roll and every time the roll is reground and placed in the machine. Then careful study of these records will suggest economical improvements in the rubber roll conditions of the mill. Most important of all, rubber rolls with a minimum of density variation across the width of the roll can be ordered and insisted upon.

Pointers for the Engineer

W. F. SCHAPHORST, M. E.

Power Plant Economics

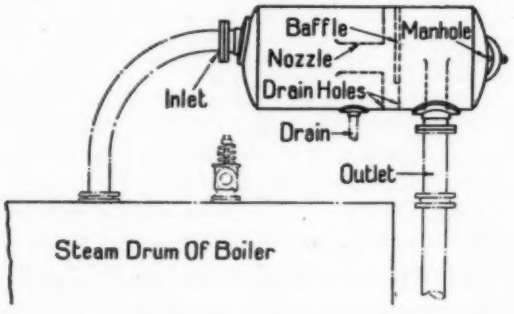
WHEN a paper mill's power plant is in a run-down condition there is danger that some official will be persuaded to swing over to the other extreme and purchase all current from a central power station. This point was well treated in a recent letter in **Power** under the heading "Economics Will Give the Final Answer" in which its author said this:

> "An example of the faulty conclusions to which some of these enthusiasts can be led was given by a salesman who closed a big contract with a paper mill for the supply of all its current. The proposition involved scrapping all steam equipment and spending over a half million dollars for substation, motor drives, etc. This salesman immediately concluded that for a paper mill to do anything but buy all its power was the height of folly.
>
> "All that was required to show why the mill was willing to buy all its power was just one brief trip through the mill. Steam engines were scattered in dark, dingy, out-of-the-way corners all over the place. They must have been operating for at least 50 years, and they were in a terrible condition. Here was a plant where a combination operation plan would have worked out wonderfully, a steady 24-hour demand for low-pressure steam with power requirements in excess of corresponding steam needs. This excess could have been bought at a high load-factor and a bleeder turbine or high back-pressure engines used for making the bulk of the power with steam needed for process work at a low pressure.
>
> "Many manufacturing plant loads are secured by the public utility in a similar fashion—the private plant has become so obsolete that any change at all would be a change for the better. In many of these cases, combination operation offers the real solution to the power and heat problem."

Separator and Steam Purifier

SOMETIMES difficulty is experienced with foaming and priming when boilers are operated at high ratings. I am informed of an instance where the boilers are regularly operated at 200 to 300 per cent of rating and where the priming was so severe that the superheat was reduced to 75 degrees F. Besides, the superheater tubes became so choked with deposit that it was necessary to cut out and replace elements every four days. This, of course, was expensive, required much time, and interfered seriously with the operation of the plant.

To overcome these difficulties, a separator was installed between the steam drum and the superheater as shown in the accompanying sketch. The separator removes the water but does not return the water back to the boiler. In other words, this separator does the work of a deconcentrator, a separator, and a steam purifier. The old troubles have been overcome altogether.



It is said that with this type of separator, less than one-half of one per cent of moisture remains in the steam after passing the baffle contained in the separator when operating between 250 and 300 per cent of rated load. Since the installation of the above separator, it has not been necessary to replace a single superheated tube and no deposits have accumulated. Instead of the former superheat of 75 degrees F., it is now 150 degrees, and it is obtained regularly.

Don't Build Ridge Crowns

IT is a mistake to build up a ridge crown or to shift the crown of a pulley over to one side in order to make the belt run true.

Instead, the proper thing to do is to correctly align

the pulleys and be sure that the belt is perfectly straight and flat. Makeshift arrangements are always unsatisfactory and uneconomical.

This is inspired by an article appearing in a prominent publication in which the belt operator said he had a great deal of trouble with a belt because it did not run true on the pulleys. The belt persisted in running off to one side, bringing one edge in contact with the outboard-bearing pedestal of the generator. As a result, the edge of the belt became "stretched and worn and began to flare out."

In "overcoming the difficulty" he moved the crown of the pulley from the center of the pulley to one side. He drilled a ring of 1/8-in. holes around the pulley face at the place where he wanted the new crown, and he riveted a strip of rawhide belt lacing in that position, thus giving the pulley a new crown that was off center. He writes that thereafter the belt ran true as the effect of the new crown was to force the belt to the center of pulley.

In the long run, a false crown of this kind is bound to cause premature wearing out. Also, it lifts the belt up out of contact with the pulley so that it cannot transmit full capacity. Every square inch of belt surface should make contact with the pulleys to obtain maximum capacity. As an emergency repair, a false crown is all right, if needed. But don't let the drive continue in that fashion permanently.

Special Pipe Fitting

ENGINEERS often appear to forget that in piping installations, "special work" usually adds vastly to the cost of any job. Special work should be avoided wherever possible. In many places we commonly see very awkward and expensive arrangements of piping due to the effort of the designer to make use of stock fittings. Usually this is poor economy. Besides, in many installations the operation of the plant is hampered by inappropriate fittings that have been installed in the name of economy.

This is where the value of pipe bends come in. No two installations require exactly the same arrangement of piping, hence they do not require exactly the same bends or the same shape of coils or the same size of piping. A simple, inexpensive bend eliminates the expense of a special fitting and the cost of threading, of flanges, of pipe-fitter labor, etc. Pipe bending and its economies are worth studying.

Fans Should Handle Coolest Gas

WHEN installing a fan, remember that considerable power can be saved by having the fan handle the gas when the gas is cool rather than when it is hot.

For example, handle the air before it goes into the furnace. Don't install the fan as an exhauster if the exhaust method can possibly be avoided.

The reason why hot gas should not be handled is that the horse-power varies directly as the **absolute temperature** of the gas. Thus, if the temperature of the air is 100 degrees F. before it goes into the furnace and if it is 500 degrees F. by the time it gets into the chimney, it would require 960÷560=1.7 times as much power to handle the hot gas as to handle the air before entering the furnace. In other words, there would be a continual and unnecessary waste of 0.7 horse-power.

Higher Shaft Speeds

HERE is a useful kink: when installing a machine that is to be driven by a cone pulley, the proper way to select pulley sizes to drive that machine is to take into consideration only the slowest speed combination of the machine. In other words, belt up the machine in such a way that when it is running at its lowest speed and the belt is on the slowest speed cone, the speed of the machine will be as slow as it probably will ever be used. Never permit the wasting of a cone pulley for a speed that is so slow that it will never be used, because then that combination surely is wasted. By basing pulley diameters entirely upon this slowest speed the other speeds being higher will take care of themselves.

Obviously, this method makes for higher speeds in the average operation of the machine, and consequently in the end, there is a greater quantity of production.

To Cool Liquids Quickly

TO COOL liquids quickly, agitation is necessary. The importance of agitation can be simply demonstrated by taking a milk bottle and filling with warm water of a given temperature. Then place the bottle in a pail of cold water. Do not stir the water in either the milk bottle or in the pail. By means of the thermometer take the length of time necessary for the temperature to drop a given number of degrees.

Then try the experiment again using a fresh supply of water in the milk bottle of the same temperature as before. Place it in a pail of cold water of the same temperature as before but this time stir the water in the pail. Take the length of time necessary for the water in the milk bottle to drop the same number of degrees as before. It will be found that the temperature drops much more quickly.

Then try it for a third time simultaneously agitating the water in the bottle and in the pail. It will be found that the drop in temperature is still quicker. Simply suspend the bottle in a pail of cold water and allow cold water to flow on the bottle. Being suspended the bottle will move constantly while the water flows upon it, the water being both the cooling medium and the agitating force. This method eliminates all manual efforts and requires no apparatus whatever. This explains why agitation is advan-

tageous and is one of the reasons why double pipe coolers are so popular. In double pipe coolers we have agitation in both liquids simultaneously and the liquids flow in opposite directions—an ideal combination.

Calls Welding Unreliable

SOME very interesting and valuable facts regarding fusion welding were recently given to engineers in an address by Alonzo G. Pack, of the Interstate Commerce Commission.

Mr. Pack says that it is dangerous to use fusion welding on important parts where failure of such parts may be the cause of accidents. I agree with him and I believe most modern designers and engineers agree with him if they know anything at all about fusion welding.

Fusion welding is a new art and, as is the custom, new arts are generally carried too far. There usually is a reaction and the pendulum swings in the other direction so that considerable time elapses before the new art finally finds its proper place. Fusion welding has not yet found its proper place. Its advocates are inclined to be "wild" and are making claims for it that sometimes border on the ridiculous.

Actual figures were cited by Mr. Pack of 563 boiler sheet failures. 158 of the boiler sheet had fusion welded seams and 122 of the 158 failed. In other words, 77.2 per cent of the fusion welded seams failed. On the other hand, 313 of them were riveted seams, of which only 16 per cent failed. Surely these figures speak louder than anything more that I could possibly write.

Seventy-five Million Barrels of Oil

IT IS estimated that approximately 75,000,000 barrels of oil are consumed annually in refining all of the crude oil produced in the United States each year.

The Bureau of Mines reports show that in 1925, 740,000,000 bbls. of crude oil were run in the stills. The yields were as follows:

Gas and Fuel Oils	364,991,000
Gasoline	259,601,000
Kerosene	59,689,000
Lubricating Oils	31,055,000
Asphalt	15,071,000
Coke	5,292,000
Wax	2,124,000

To produce these products, 120,000,000,000 cubic feet of gas was used; 6,000,000 tons of coal; and 50,000,000 bbls. of fuel oil. Altogether, roughly, these are equivalent to 75,000,000 bbls. of fuel oil which is a considerable amount of fuel and indicates a tremendous expense for the refiners to produce the finished products. It is well to bear in mind the fact that refiners do not get crude oil for nothing in the first place. The handling alone, of the above 50,000,000 barrels of consumed oil, and 6,000,000 tons of coal, is a herculean task and a costly one.

Suitable Paper for Soap Wrappers

THE properties of a paper intended for use as a soap wrapper were the subject of an inquiry by the Technical Association of the Pulp and Paper Industry a short time ago, under the Service to Members plan, and some interesting and informing replies were received. From a study of the replies, it is evident that paper to be used for wrapping soap should be alkali fast and possess the general properties of a paper made from well cooked sulphite pulp and beaten hard; in other words, resemble a greaseproof or imitation parchment paper.

The queries as originally stated read as follows:

1—What qualities are required of an alkali-proof paper?

2—What is the best test for such a paper?

3—What type of furnish is satisfactory and what type unsatisfactory?

4—I assume it is customary to use a furnish with a good proportion of alkali-treated fiber. Tests with caustic soda indicate soda pulp to be practically as much discolored as sulphite pulp. What causes the discoloration and why does not soda pulp withstand the test?

The character of the answers to the foregoing queries are not such as to permit of giving them in full, but the important points brought out in the various contributions may be presented, it being understood that no responsibility is assumed for the accuracy of the statements and opinions advanced.

In a majority of the answers, the use of paper made from a mixture of bleached sulphite pulp and bleached soda pulp is favored, all unbleached fibers, or any admixture of groundwood, being objected to for the reason that the lignin and other organic residues contained in them would be likely to cause discoloration when the paper was brought in contact with an alkali. It would appear to be true that the higher the alpha cellulose content of a paper is, the better able is it to withstand one of the soap manufacturer's tests for soap wrappers, which consists of wrapping the paper around a cake of fresh soap keeping it in contact therewith for a certain length of time and examining it at intervals for discoloration. Another method of testing the paper is to cut a fresh cake of soap at the factory, place the paper between the two halves, press the two halves together, and allow to stand for eight to ten hours.

Paper or ink which withstands this test is usually satisfactory to the soapmaker.

The tests employed by one soap manufacturer to determine the quality of a paper intended for use in the wrapping of bar soap, are stated as follows:

> **Drop Test.** Allow 4 or 5 drops of half normal caustic soda to run across the paper to be tested, letting any excess run off. Hang up to dry without further treatment. Note the intensity of discoloration caused by the caustic. Practically no discoloration should occur.
>
> **Soaking Test.** Soak a piece of paper in half normal caustic soda for exactly ten minutes. Remove, and holding flat on the fingers, wash with a stream of water, preferably siphoned from a distilled water carboy, and dry. Note discoloration and also how much sheet is broken and weakened due to this treatment.

This soap manufacturer makes the interesting observation that soap wrapper stock made from soda pulp usually discolors badly, but one who is evidently a rival soapmaker gives the information that he uses an alkali-proof M. F. Book, **a soda pulp paper,** which does **not** discolor, and **does** withstand the test. So there you are!

The necessity of exercising care in the sizing of the stock, with avoidance of any excess of alum, is emphasized in some of the replies. In the case of a colored paper the dye should be selected with care so as to avoid one that is likely to fade in contact with an alkali. It is recommended to use a direct color rather than an acid or basic color. The color should undergo no change in contact with a weak solution of caustic soda applied as a test. It is often the case, however, that a sheet which may be stable in the presence of caustic soda solution will undergo discoloration when used for wrapping soap. The cakes or bars of soap are wrapped when hot, and in cooling some of the moisture may be condensed on the wrapper which will then take on a spotty appearance.

One of the responses indicated that the writer had never succeeded in making a true alkali-proof paper, but that the soap wrapper might be rated as alkali resistant, according to the ingredients of the soap. With soap that had been thoroughly dried before being wrapped any kind of paper would be satisfactory.

In the case of ordinary kitchen soaps, it would be satisfactory to provide a paper furnished with as much old paper stock, bleached, as could be run on the paper machine to meet the specified strength requirements, together with a mixture of sulphite and soda pulp; sized with combined rosin, and colored with an alkali-resistant dye.

Objection was made by one of the contributors to the use of the term "alkali-proof" which he held was an inaccurate term to designate a fast to alkali sheet. A paper possessing fastness to alkali in respect to its color was described by this contributor as one in which the hue does not change at any point in hydrion concentration above pH-7.

This contributor also took exception to the form of Question 4, as in his opinion the pulp, or method of preparation of the pulp, had nothing to do with the results, these being dependent on coloring matter in the paper which may be present either as residues or added coloring matters. "As the active chemical agents involved in preparing the fibres are not colored it is clear that any residual coloring matter is dependent upon the wood or raw material from which the fibre originated. The conduct of this coloring matter toward alkali determines the result in the form of the paper, insofar as the residual coloring matter is concerned. In respect to dyed papers, of course, the dyes which are used must possess the quality of being fast to alkali, at least to the degree as defined. All the color companies should certainly know the characteristics of each of their dye products and should not make the mistake that some do, of supplying dyes which are not fast to alkali for use in papers, particularly such papers as are used for wrapping and may come in contact with alkalis."

In the foregoing contribution, inordinate stress appears to be placed on the reactions of dyes used in tinting, and the criticism of phraseology employed in sending out the queries are likely to be considered captions. Most of the laundry soaps of commerce are strongly alkaline compounds of sodium resinate, and papers that become discolored in contact with them are likely to contain much groundwood and accordingly be not beaten sufficiently to impart the proper parchmenty property.

Little appears to be known regarding the actual cause of discoloration of a soap wrapper. The alkali alone may not be responsible, as when soap sweats the moisture exuding from it and which is absorbed by the paper, may contain various organic compounds besides caustic alkali. Then, too, the alkali used in forming the soap may be at fault and it should be tested to determine whether caustic soda, sodium carbonate, or sodium silicate has been used. A small proportion of wax may be combined with the sizing to good effect, according to one contributor, though in another response the opinion is ventured that the discoloration complained of might be caused by the rosin size and could be overcome to some extent by using a low rosin-sized sheet which has been tub sized as well subsequent to manufacture.

Play Safe! An ounce of prevention is worth a peck of trouble.—Making Paper.

Editorial Comment

By WILLIAM SIBLEY

Today's Engineer Must Be of a Different Breed

THERE is a story going the rounds just now of a man who, for twelve years, had been the engineer for a Chicago manufacturer. Some months ago this manufacturer decided to install an air conditioning system. The engineer, however, had never before handled refrigerating or humidifying equipment, with the result that shortly after the installation, he attempted to start one of the refrigerating machines with the discharge valve shut. This, of course, blew out a gasket, lost a large portion of the ammonia charge, created a panic in the plant and was the means of the engineer losing his job.

In another plant an engineer grown iron-gray in service was compelled to make way for an electrically-experienced man because the management has replaced leather belts with motors and direct drives.

Engineers of today have real need to be of a far higher stamp than the engineers of 20 years ago. To merely understand the setting of engine valves, how to start and stop engines, pumps or compressors, or the rudimentary principles of boiler operation is no longer sufficient. The new appliances and devices now available and needed, while simple in themselves, frequently involve new principles.

One of the chief concerns of equipment manufacturers is the man who is to run their machinery once it has been installed. In the minds of many manufacturers the average engineer has failed to develop with the rapid evolution that is and has been going on in every branch of industry. Perhaps they are wrong in this. Or, perhaps it is as impossible for the engineer to do this as it is for the average man-in-the-street to fully understand all the new devices that are constantly arising.

Edison once said we now have more inventions than we can efficiently use. Scientists and inventors have so loaded the human race with new devices that we cannot put all of them to good advantage. And we are inclined to agree. Put an automobile in the hands of an average man and it will be a wrecked car in three or four years, whereas in the hands of an engineer the same car would give good service for ten to fifteen years.

The same principle holds with combustion, power, transportation and processing machinery. Many engineers are totally unqualified to properly handle the newer and more efficient devices with the result that such devices, through early failure, become prohibitively expensive. Because of this there is a real place for real engineers in industry today.

Building and Yard Maintenance

WITH the advent of warm weather comes the opportunity to effect needed repairs to building exteriors, masonry, and yard equipment which may be showing the rigors of winter and delayed maintenance. Naturally the kind of maintenance work will differ with the type of building, but a few thoughts along general lines should serve as a reminder that it is at this time of year such work should be done.

Make sure the roofs are clear of all dirt, debris and tree branches, and that the down-spouts are clean. Watch the flashings for possible cracks and where found repair with hot tar. Tin roofs should be painted at least every three years with bad spots touched up annually. Exterior down-spouts that have become clogged may be cleaned by turning exhaust steam into the bottom of the spout.

If the buildings are remote from heavy traffic they may be sprayed for durability, but buildings which are seen by public traffic should be painted frequently and kept spick and span, since this is of distinct advertising value. Wood and steel sash needs painting every three years and where not tight should be provided with metal weather strippings. This usually pays for itself in just a few winters through reduced fuel bills. Brick walls should be painted if the mortar is beginning to loosen. Pay special attention to cornices, parapet walls and chimneys, as these are subject to more rapid deterioration.

Corners of buildings or walls that have been broken by motor truck wheels or bumpers may be repaired by the placement of an angle iron to a height of four or five feet. In patching concrete floors, chip the top dressing down to the under floor, then paint with a neat cement wash and apply the new top dressing immediately so that there may be a good bond between the old and the new. Paved alleys should be watched for pits and hollows as these retain water and hasten depreciation.

Maintenance work is exceedingly important and must be well and consistently done if the plant property is to be kept in good repair. Such work, carried on year by year, will do more than anything else to maintain physical valuation. If, instead of taking care of the plant, it is allowed to run down, even to the extent of wearing out the floors, inter-plant

—— on Timely Subjects

transportation costs will mount, employee morale lowered, and the rate of depreciation increased. Systematic maintenance programs, carefully carried out every summer, will have a real, beneficial influence on the ledger showing at the end of the year.

Forecasting the Second Half

FOLLOWING is a summary of the current views of leading economists and authorities on business conditions. The review of the many statements which led to this summary confirmed the writer's belief in the stability of existing business. In spite of strikes, floods, spotty agriculture, and other factors, business in general is very healthy, and enjoys sound prospect for a continuance of good health.

Harvard Economic:

Business should hold to something like present levels, or possibly increase during the next few months. The Japanese crisis is unlikely to have any important effect on the money market here.

Banker's Economic:

The recent minor reaction in the stock market was followed, not preceded, by pessimism as to general business. Money still continues abundant, with no apparent indications of a change.

Brookmire:

Steady reduction in volume of U. S. obligations, with a probable tax reduction, will doubtless stimulate business. Financing, which is at new high records, gives evidence of the large amount of available capital seeking investment.

Gibson:

As general business should about equal that of last year, neither optimism nor pessimism is warranted. Declining commodity prices will have a favorable effect on the railroads.

Moody:

Operations of our major industries are undisturbed and while serious the floods can hardly become a national disaster. Interest rates are showing a downward tendency, and this should continue for three months at least.

Babson:

Business should continue in large volume during the coming months. While this means good production it does not necessarily mean industrial expansion. Sales figures for the next few months should approximate those of last year.

United Business Service:

Remarkable stability existing in current business will likely continue unchanged for three or four months. Collections generally are no better than fair although money continues easy.

Poor's:

General business should be favorably effected by building for some months to come. Unless the coal strike outlook changes, coal, coke and pig iron prices may be lower.

Alexander Hamilton:

The present appears to be a period wherein the reaction of certain industries is offset by prosperity in others. Employment figures, as a whole, are only slightly under last year. The present position of commodity prices is one of general steadiness.

The Department of Commerce Formula

A VAST amount of study on business management and elimination of waste has been reduced to formula by the U. S. Department of Commerce. This formula appeared in the Department's news bulletin and consisted of eight rules which might well apply to any industrial enterprise. The eight points follow:

1—Define your purpose. You must know what is to be done before you can know how. This is your master task.

2—Analyze your problem. Your master task then will break up into many detail tasks. Consider them all. Neglect none.

3—Seek the facts. Study every condition governing each task. Find the undesirable element to be eliminated and the desirable element to be retained. Then standardize right conditions.

4—Devise the one best method. Aim to conserve energy, time, space, material. Determine relations of details to the master task.

5—Find the person best fitted. For each task certain personal qualities are essential. In each person certain qualities dominate. Find the person best fitted.

6—Teach the person best fitted the one best method. Not by driving, but by thorough, patient teaching are understanding and skill developed.

7—Plan carefully. Right planning of arrangement and sequence of work will enable you to accomplish tasks in logical order, accurately, quickly, economically.

8—Win co-operation. Co-operation means working together. It cannot be demanded. It must be won. Accept your share of the responsibility. Respect the right and aspirations of others.

The Paper Industry Annual Safety Contest

April Scores

40 Mills Made Perfect Scores

PERFECT SCORES

	PARTICIPANT	NAME OF MILL	LOCATION
Group A	The Champion Coated Paper Co.	Paper No. 2	Hamilton, Ohio
	Kimberly-Clark Co.	Niagara	Neenah, Wis.
Group B	American WritingPaper Co.	Power & Repair	Holyoke, Mass.
	Louis Dejonge & Co.	Stapleton	Stapleton, L. I., N. Y.
	Falls Manufacturing Co.	Oconto Falls	Oconto Falls, Wis.
	Hollingsworth & Vose Co.	E. Walpole	Boston, Mass.
	Hollingsworth & Vose Co.	W. Groton	Boston, Mass.
	International Paper Co.	Glen, No. 5	Berlin, N. H.
	International Paper Co.	Fort Edward, No. 2	Fort Edward, N. Y.
	International Paper Co.	Niagara Falls	Niagara Falls, N. Y.
	Kimberly-Clark Co.	Kotex	Neenah, Wis.
	Strathmore Paper Co.	No. 2, Woronoco	Woronoco, Mass.
Group C	Union Bag & Paper Corp.	Fenimore Paper	New York
	Union Bag & Paper Corp.	Cheboygan Sulphite	New York
	Union Bag & Paper Corp.	No. 5	New York
	American Writing Paper Co.	Albion	Holyoke, Mass.
	American Writing Paper Co.	Dickinson	Holyoke, Mass.
	American Writing Paper Co.	Gill	Holyoke, Mass.
	American Writing Paper Co.	Mt. Tom	Holyoke, Mass.
	American Writing Paper Co.	Norman	Holyoke, Mass.
	Bird & Son, Inc.	Phillipsdale	E. Walpole, Mass.
	Defiance Paper Co.	No. 3	Niagara Falls, N. Y.
	The Gardner & Harvey Co.	No. 2	Middletown, Ohio
	The Gardner & Harvey Co.	No. 3	Middletown, Ohio
	International Paper Co.	Fall Mountain	Bellows Falls, Vt.
	International Paper Co.	Livermore	Chisholm, Me.
	International Paper Co.	Riley	Chisholm, Me.
	International Paper Co.	Webster No. 9	Orono, Me.
	Kimberly-Clark Co.	Atlas	Neenah, Wis.
	Kimberly-Clark Co.	Badger-Globe	Neenah, Wis.
	Kimberly-Clark Co.	Neenah	Neenah, Wis.
	Lincoln Pulp and Paper Co.	Lincoln	Merritton, Ont., Can.
	Marinette & Menominee Paper Co.	Menominee	Marinette, Wis.
	Provincial Paper Mills, Ltd.	Montrose Div.	Thorold, Ont., Can.
	Robertson Paper Co.	Montville	Montville, Conn.
	Sorg-Oglesby-Smith Paper Co.'s	Smith	Middletown, Ohio
	Strathmore Paper Co.	No. 2, Mittineague	Woronoco, Mass.
	U. S. Gypsum Co.	Oakfield	Oakfield, N. Y.
	U. S. Gypsum Co.	Gypsum	Chicago, Ill.
	U. S. Gypsum Co.	Lancaster	Chicago, Ill.

IMPERFECT SCORES

GROUP A			GROUP B			GROUP C		
Key	Rank	Rate	Key	Rank	Rate	Key	Rank	Rate
A-22	3	.05	B-11	11	.08	C-26	29	.03
A-10	4	.06	B-29	12	.11	C-52	30	.06
A-25	5	.07	B-9	13	.15	C-29	31	.06
A-9	6	.07	B-18	14	.20	C-23	32	.10
A-12	7	.07	B-3	15	.20	C-40	33	.10
A-13	8	.08	B-16	16	.26	C-41	34	.11
A-20	9	.08	B-25	17	.27	C-15	35	.14
A-5	10	.09	B-24	18	.29	C-6	36	.18
A-6	11	.19	B-26	19	.31	C-31	37	.18
A-7	12	.19	B-36	20	.33	C-42	38	.21
A-17	13	.21	B-34	21	.37	C-35	39	.21
A-2	14	.22	B-31	22	.41	C-30	40	.24
A-4	15	.29	B-35	23	.47	C-10	41	.30
A-19	16	.30	B-17	24	.50	C-5	42	.39
A-1	17	.32	B-30	25	.50	C-14	43	.40
A-15	18	.32	B-8	26	.54	C-34	44	.43
A-8	19	.46	B-7	27	.64	C-45	45	.51
A-24	20	.55	B-4	28	.80	C-24	46	.60
A-3	21	.70	B-13	29	.91	C-57	47	.60
A-23	22	.76	B-13	30	1.70	C-50	48	.61
A-16	23	.76	B-10	31	2.02	C-8	49	.64
A-11	24	1.14	B-2	32	2.65	C-20	50	.67
A-21	25	5.14	B-12	33	11.36	C-17	51	.83
						C-12	52	1.12
						C-48	53	1.19
						C-11	54	1.22
						C-51	55	1.23
						C-28	56	4.23

NASACO LOG

Many Conferences Nearing

THE annual Fox River Valley Safety Conference, to be held on June 14 in Sheboygan, Wis., is a fine opportunity to have a good time and exchange experiences on protecting that all-important thing—human life. Detailed program is published elsewhere in this issue.

Southern State Safety Conference at Birmingham, Ala., June 15-16, should draw great numbers in that territory. This conference will be composed of general sessions only.

Atlantic Coast Safety Conference will be at the Bellevue-Stratford Hotel, Philadelphia, Friday, June 24. General sessions on Safety will be held.

Our good friend, W. A. Gleason, Hammermill Paper Co., was elected president of the Erie Safety Council recently. Congratulations!

John Lundrigan represented the Paper and Pulp Section at the meeting of Sectional Officers, National Safety Council, held in New York City, May 14.

Is It Fate?

Kimberly-Clark's Spruce Falls mill has had an excellent record so far in the contest, but was forced to be withdrawn from the contest this month because of failure to report.

International's Fall Mountain, Vermont, mill was one of the leaders in Group C having had a perfect record to date, and notice was received the mill closed down May 11.

Scores Show Lower Frequency Rate

The accumulative frequency rate for the contest to date is 34.19 as compared with the frequency rate of the entire Paper and Pulp Section in 1926, of 36.77, and the rate of 42.03 which was the accumulative frequency rate for the section for the past seven years.

"Statement of Facts"

Don't fail to return the signed "Statement of Facts" just sent out by the National Safety Council, as this statement must be in the hands of the judges before any award of prizes is made.

TELLING SCORES

	January	February	March	April
No. of Mills	119	116	115	114
Total Hours Worked	8,363,734	7,876,213	8,573,278	8,707,808
No. of Accidents				
Death	1	4	2	2
Permanent Disability	1	2	6	2
Temporary Disability	332	274	274	246
Totals	334	280	282	250
No. of Days Lost				
Death	1000	4000	2000	2000
Permanent Disability	300	350	590	250
Temporary Disability	3417	3204	3635	2520
Totals	4717	7554	6225	4770
Frequency Rate	39.95	35.56	32.89	28.72
Severity Rate	.56	.96	.73	.55

Superintendents' Association Holds Inspiring Meeting

Eighth Annual Convention at Richmond, Va., May 26, 27 and 28 Marked by Papers and Discussions of Great Interest and Value

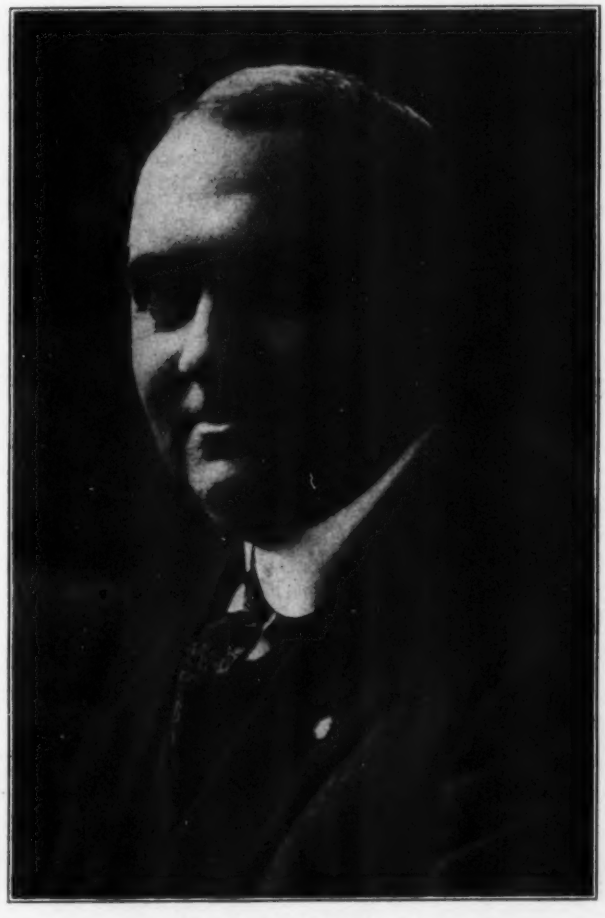
MEMBERS of the American Pulp and Paper Mill Superintendents' Association who journeyed to Richmond, Va., for the annual meeting held there May 26, 27 and 28, were treated to a full program of papers and discussions on a wide variety of topics related to pulp and paper mill engineering, as well as forestry, waste prevention, testing of pulps, developments in American coating clays, safety practices in mill operations and the technique of beating. Our own Harry Williamson's rapid-fire talk on hydration of stock in the beater at one of the sittings earned for him the hearty admiration of a crowded auditorium and stamped him as a master papermaker. Thereafter, whenever a question of influence of beating on fibre came up, it was not settled till he had been heard from.

The general program of scientific and social events was excellently arranged and reflected the utmost credit on the Committee of Arrangements, headed by Carl Magnus. President Rooney is entitled to special praise for his management of the sessions, which he was prompt in opening at the scheduled hours and conducted with businesslike precision, confining authors or papers and discussions strictly to their allotted periods of time.

Mill Equipment Impresses Visitors

The paper mills of Richmond were open to any members who cared to visit them, and there was an excursion to West Point, Va., provided by Engineer Louis C. Marburg, of Marburg Bros., New York, to inspect the operation of a Biffar refiner in the mill of The Chesapeake Corporation. In this refiner the screenings and similar rejections in the manufacture of woodpulp are reduced by friction between a stationary and a revolving stone. The stock after passing through the refining stones flows automatically to a centrifugal screen in the housing of the machine, and any coarse particles rejected by the screen are automatically returned to the stone for regrinding, this being effected by means of a spiral conveyor. A certain amount of play is allowed to the stationary stone, so that a squeezing or teasing rather than a grinding or cutting action is exerted. The power requirement of the machine varies from 20 to 50 h. p., both stone and screen being rotated at from 220 to 300 r.p.m. No pump is required for circulation.

A Kamyr wet machine with drying part in operation at the Chesapeake mill also attracted attention. The Kamyr machine is equipped with a suction cylinder and grooved press rolls, the grooves constituting the patented feature, as they permit of drainage of water without felts.



President Fred J. Rooney

But it was the high-pressure boiler and turbine plant of the mill that made the greatest impression on the visitors. The steam boilers are operated at a pressure of 425 lbs., and the steam passed through a Westinghouse turbine to generate most of the power required for driving the machinery, while exhausting into an old steam header at a sufficiently high pressure to supply process steam for all mill purposes. Although great economies in production have been effected by the use of high steam pressures, electric and steam-power being obtained practically as by-products, the system is not yet working smoothly and certain readjustments will be necessary before the plant can be worked to full capacity. The Ljungstrom air preheater was undergoing alterations when the mill was visited and most of the machinery was down; the turbine blades and oiling system are not giving complete satisfaction and changes will also have to be made in their design. The party was conducted through the plant by Elis Olsson, general manager, and enjoyed an explanation of the new high-pressure steam system as made by R. S. Bayntun, the engineer who designed the plant, the actual work of construction being done by the Rust Engineering Company, of Pittsburgh.

Excellent Entertainment

The character of the entertainment provided at the banquets was of an unusually high order. James F. Ryland, vice-president and general manager of the Standard Paper Manufacturing Company, presided as toastmaster at the joint banquet for men and women on Thursday evening, when a humorous talk was given by Dr. D. W. Daniel, of Clemson College, Clemson, S. C., and Elinor Fry and her pupils, including some wee

tots of girls not more than three years old, danced in costume to the enthusiastic delight of an appreciative audience. In addition, Ruby Vaughan Bigger staged tableaux vivants giving glimpses of the social intercourse of the old South, the players being dressed in authenic colonial costumes. A white quartet sang songs with fine effect and there were spirituals and blues by a negro troop which were greatly enjoyed.

Contrasting English and American Humor

Alvin M. Smith, of Richmond, was toastmaster at Friday's banquet when some remarkable "stunts" were pulled off by actors from New York, including one clever gentleman who impersonated "Sir Charles Bartholomew, president of 'British Papers Ltd.', London, England," and "President of the Liverpool Board of Trade." After a really authentic and informing description of the economic conditions now prevailing in Great Britain, "Sir Charles" gave some contrasting specimens of English and American wit and humor. He credited Carl Magnus with saying that the best way to make an Englishman enjoy his old age was to tell him stories when he was young. It was understood that this was an American's understanding of the length of time it took an Englishman to see the point of a joke. But, in favor of the Englishman, "Sir Charles" said he saw one enter a barber's shop and give the curt order: "Cut all three short!" "What," asked the barber. "Hair, whiskers, and chatter," said the Englishman. The following colloquy then ensued: Barber—"Have you been here before?" "Yes." "I don't remember your face." "It has healed up."

Sir Charles then descanted on some of the difficulties experienced by him during a visit to New York on account of his inability to speak so many foreign languages as are required there. He also spoke of a trip to the seaside after boarding a "Cohen's Island train."

Urges Safeguarding Liberty

After Toastmaster Smith had delivered himself of a vigorous and eloquently worded message urging those present to take a greater amount of interest in political affairs so that some of the liberties that were once the birthright of an American citizen might be preserved, he announced a special dance and acrobatic performance by two artists from New York, than which, it may be remarked, there was never a finer performance given at any papermaker's banquet. Following this, there was an hour of song and story by D. L. Leftwich, who began by reciting a negro dialect story by Erwin Russell and telling other stories dealing with the traits and habits of the old-time southern darkey, all in the most approved negro dialect.

A Clever Stunt

One of the most astonishing performances at the men's banquet on Friday evening was the impersonation of a headwaiter by a vaudeville actor from New York. His victim was Herb. Server, of the Oxford Miami Paper Company, who occupied a seat at the head table. After annoying Mr. Server by repeated requests to have him remove his hat from a radiator behind him, on which it was resting, the actor waiter then wandered about the hall making comments to some of the guests about Mr. Server and his hat, which tended to further irritate the victim of his attentions who took him seriously. At a point when a number of superintendents were getting ready to seize the headwaiter and throw him from the hall, the actor's partner in the performance, who was apparently posing as a superintendent, made a furious attack on him that started a near-riot. Police whistles were blown and officers, headed by the house detective, came running in, and seizing both performers started to handcuff them, when a diversion was made by Toastmaster Smith who joined the excited group and ordered both men up on the stage where they were told to settle their differences by putting on boxing gloves and fighting to a finish. This ended the performance and brought relief to a large number of diners who were completely deceived by the play acting.

PROCEEDINGS IN DETAIL

The eighth annual meeting of the American Pulp and Paper Mill Superintendents' Association was opened at 10:15 A. M. Thursday, May 26, in the auditorium of the Jefferson Hotel, Richmond, Va., by Carl Magnus, general chairman of the local committees, who extended welcome on behalf of the paper mills of Richmond and the officers and members of the Southeastern Division of the association. He invited close participation in the work of the sessions. His committee had set the stage and provided the working tools. The association was theirs and all would benefit in proportion to the work they put into it.

The meeting was then turned over to President Fred J. Rooney who asked all to stand in silent tribute to the memory of three members who had passed away during the year. Prayer was then offered by the Rev. S. B. Cousins, D.D., pastor of the Second Baptist Church, of Richmond.

Official Welcome to Richmond

In the absence of the Mayor of Richmond, Col. R. Keith Compton, Commissioner of Public Works, gave the official welcome to the city. He explained that Mayor Bright had been unexpectedly called out of the city on municipal business and he had been delegated to take his place. In a most cordial manner, Colonel Compton made the visitors free of the city and expressed the hope that their stay would be an enjoyable and profitable one. He gave some interesting particulars concerning the development of papermaking in Richmond since 1834 when the plant of the Franklin Paper Mill was first operated. Near the close of the Civil War, when Richmond was evacuated by the Confederate troops, the mill founded by this company was destroyed. After the war, the Richmond Paper Manufacturing Company rebuilt the mill and operated it until 1913 when it was sold to the Standard Paper Manufacturing Company. The present Manchester Board & Paper Company, of Richmond, succeeded the Manchester Paper Mills Company, organized in 1863. The Albemarle Paper Company, of which H. W. Ellerson is president, was organized in 1887 and is still one of the city's great firms.

The Capital of Virginia.—Colonel Compton gave some interesting historical facts concerning the history of the city as the capital of Virginia, the third capital which the State has had, Jamestown being the first. He mentioned that Richmond was the only city in America having a triple railroad crossing and as evidence of its industrial facilities, he said that five trunk lines of railroads enter the city. He closed a fascinating account of historical and industrial Richmond with an account of the public improvements which had been planned by the city authorities for the next ten years.

Response for the Association

Benjamin T. Larrabee was asked to respond to the city's welcome, which he did in a most effective and pleasing way, improving the opportunity to call attention to the ideals of the association and the realization on the part of the officers of establishing a standard of high morale. He said he felt sure that at the close of the convention the superintendents would love Richmond so much, and the people of Richmond would be so favorably impressed with them, that they would be asked to come again.

William T. Dabney, business manager of the Richmond Chamber of Commerce, told a number of funny stories as a prelude to assuring the members that the Chamber of Commerce stood ready to assist in every way to make the convention a success.

Before presenting his annual address, President Rooney called attention to the presence in the hall of Fred C. Boyce, the first president of the association, and he asked Mr. Boyce to stand up that all might recognize him.

President's Address

In his annual message, President Rooney paid tribute to the untiring work in the interest of the association performed by Secretary Eminger, who, he hoped, would be continued as secretary indefinitely.

Division Meetings.—He said that the eleven divisions of the association had held a total of twenty-seven meetings during the year. Regret was expressed over the failure of the Penn-New Jersey Division to hold a meeting since its organization in 1926 and it was hoped that the situation would be improved during the coming year. He touched on the question of organizing a Canadian division and suggested

that this be effected independently and without direct affiliation with the American Pulp and Paper Mill Superintendents' Association.

J. Norman Spawn's Appointment.—President Rooney mentioned the appointment of J. Norman Spawn to the chairmanship of the Vocational Education Committee and said that Mr. Spawn had chosen capable associates which would assure the working out of some plan or suggestion of practical value. The work of the American Pulp and Paper Mill Superintendents' Association in the line of furthering vocational education had received the endorsement of the American Paper and Pulp Association at the meeting held in New York last February.

Practical Problems.—The appointment of H. G. Funsett as chairman of the Practical Problems Committee was noted and it was intimated that this committee would be one of great value to the association. The association had now passed the organization stage and must show results of value to its membership and the entire pulp and paper industry by the full and free discussion of problems, analysis of equipment and exchange of ideas; for the function of the association was to increase efficiency in the operation of mills throughout the country by discussion among superintendents of current problems.

In closing President Rooney expressed his appreciation of the support given him by officers and members during the past year.

Address by R. B. Robertson

After the appointment of committees on audit and resolutions, President Rooney invited Reuben B. Robertson, president of the Champion Fibre Company, to address the gathering and he responded with a well considered paper on the value of association work and present-day relations of employers and employees. He said he was greatly interested in the activity and growth of the superintendents' association. For his own part he had long ago abandoned the idea that mill operations should be kept secret. Discussion of mill problems, free and frank, could not be a source of damage to any mill organization. Associations, such as the one he was addressing, but exemplified the generous spirit of comradeship and mutual helpfulness that pervades executive groups of the industry today. Turning to his prepared address, he spoke in part as follows:

Industrial Relations.—The tendency of the time is to recognize four parties to an industrial contract—the stockholder, the employee, the public and the management, the last-named as comprising the whole executive group, guarding with equal justice the interests of stockholder, employee and public.

Nothing was more important to accomplish in the interest of the stockholder than the elimination of waste. The greatest wastes were not always the most obvious. The insidious was always more dangerous than what was in plain sight, and Mr. Robertson said that the most important of an executive's duties was to change the insidious into the obvious.

Causes of Overproduction.—One of the greatest enemies of business was the indulgence of blind hope, a hope not based on careful analysis, careful preplanning and careful execution. It had given rise to much of the overproduction that confronts the industry today. With this as a basic thought, Mr. Robertson said:

"Investors see glowing reports of big profits earned by well established, favorably located, well organized mills and conclude that any mill making the same product will have equal success. If governed by hope alone they will build first and analyze sorrowfully afterwards, if governed by a more scientific attitude they will analyze first and rejoice later. Information sensibly gathered and intelligently used should be one of the major slogans of the executive, who would do justice to his stockholders."

Methods of Handling Workmen.—Mr. Robertson deprecated what he termed "the hard-boiled pickhandle methods of driving workmen," such as prevailed a generation or two ago. Leadership was preferable to dictatorship, and Mussolini, the great Italian premier, was right when he said in all relations of life duties must be considered before rights. It was a great mistake to command unless you could insist on obedience. "The employer should first satisfy his duty to his employee before demanding his rights from that employee, and the employee likewise should first fulfill his obligation to his employer before becoming insistent as to his rights."

The Spirit of the Mountaineer.—Mr. Robertson said he had great admiration for the spirit of the Tennessee mountaineer. In talking with one of his mountain friends, the great persistence of one of the successful men of the region was mentioned. The mountaineer said that this prominent citizen had had many reverses and setbacks, but he always "reared and kept acoming." Mr. Robertson said he thought this quaint old-fashioned expression of the mountains, so suggestive of the frequent bear fight and of the unconquered courage of the wounded animal, might well be taken as the slogan of the paper-mill executive in these days of overintensive competition. "He reared and kept acoming" was chuck full of a much-to-be-desired spirit of persistence.

The Kicks in Association Work.—In closing, Mr. Robertson quoted a saying of William Allen White that "there are three kicks in every dollar," the first being the thrill that comes from the acquisition of the dollar, the second the thrill of possession, and the third the thrill that came from giving the dollar away. Mr. White had enough Yankee in him to enjoy the pleasure of acquisition, enough Scotch in his ancestry to make possession a real joy, and enough Irish in his makeup to enjoy generosity.

In applying the foregoing to meetings of the superintendents' association, Mr. Robertson said that in these meetings, ideas rather than dollars constituted the medium of exchange and we should all be Yankees as to the acquisition of new ideas, Scotchmen as to holding on to them and Irishmen in our generosity toward our fellow executives in giving out those ideas.

President Rooney said the association was honored by having Mr. Robertson attend the meeting and address the members, but is was always the blsiest men and the men of most affairs who do the most. He then introduced Dr. Hugh P. Baker as the representative of the American Paper and Pulp Association, who conveyed the greetings of President D. Clark Everest, and followed this with a most pleasing address in the course of which he reminded his hearers that they belonged to an ancient and honorable industry—the only industry, too, that had changed its raw materials within a generation. Many of those in attendance, said he, must remember the introduction of wood pulp as a papermaking material, which came shortly after the close of the war between the States. He was convinced from his contact with the industry that it had within its rank men of genius, intelligence and initiative who could be depended upon to solve some of the pressing problems of the time, especially that of overproduction. He was looking forward to two very pleasant days in attendance upon the convention.

Forest Opportunities in the Paper Industry

D. A. Crocker, secretary of the Woodlands Section of the American Paper and Pulp Association was then asked to present his paper on forestry in the paper and pulp industry.

In the introductory portions of his paper, Mr. Crocker expressed doubt concerning the value of certain wood substitutes that had been proposed for the production of cellulose. Cornstalks, various grasses and other fibre plants are exploited from time to time as substitutes for wood in the manufacture of paper, but the uses of such were limited. Practical pulp and paper men are aware that cellulose is produced in the cheapest and most readily utilizable form in the forest. There was no prospect of any decrease in the demand for pulpwood, which would be likely rather to increase in direct proportion to the increased demand for paper.

Advocacy of Forestry Work.—Referring to the attention given by the American Paper and Pulp Association to methods for the conservation of pulpwood supplies, Mr. Crocker instanced the formation of a Woodlands Section within the Association. By means of the Woodlands Section, the industry had been able to carry on its own investigations, supplementing those made by public agencies and imparting the results in terms of pulpwood supply. It was owing to surveys made by the Woodlands Section of the American Paper and Pulp

Association in the Lake States and in Virginia and North Carolina that he was in a position to show that our pulpwood situation was not quite so serious as might be supposed from the present-day ratios between growth and consumption.

Consumption Compared with Growth.—Mr. Crocker called attention to the present growth of spruce, balsam and hemlock in the seven northeastern States, which was put at 1,370,000 cords by the United States Forest Service, and under intensive forestry work, 4,750,000 cords. He pointed out that this was one and one-quarter times the present total consumption of 3,800,000 cords.

As the softwood lumber industry in the Northeast was declining rapidly and the rate of expansion of pulping operations was not likely to be greater than the rate of decline of the softwood lumber industry, an eventual margin of growth over consumption might be expected. Any scarcity that might come would be during the next quarter of a century, or until the expected future supply had reached commercial size. It was pointed out that in dealing with a crop which required forty years or more to mature plans should be made so as to take in decades and generations.

Although the northeastern region was capable of producing sufficient pulpwood to maintain the industry at its present rate and allow for some expansion, it could not do so, Mr. Crocker said, unless prompt action was taken to establish the practice of forestry throughout the whole region. A great increase in the annual growth could be gained through the practice of forestry.

Situation in the Lake States.—In the Lake States, the potential growth of spruce and balsam had been estimated at 1,400,000 cords per annum, as contrasted with a total commercial consumption at the present time of nearly 1,000,000 cords. The margin of possible growth over present consumption was greater than for the Northeast, though the prospects for the immediate future were not quite so good. The question of future supply was wholly in the hands of the pulp and paper industry.

The Problem in the South.—Speaking of conditions in the South, Mr. Crocker said that in that region the problem of the forester was one of devising means of producing low-priced pulpwood, rather than of finding pulpwood in a region of scarcity. The problem had been solved by some of the larger manufacturers of sulphate pulp who were now provided with perpetual supplies on their own lands. The soda pulp mills were also attacking the problem, have laid far-reaching plans for the practice of forestry and were the most optimistic in regard to a future supply at a reasonable cost.

Public Responsibility and Private Opportunity.—Mr. Crocker believes that the pulp and paper industry can solve its forest problems with relatively slight assistance from public agencies. Nevertheless, said he, there are certain phases of forestry in which there is a public responsibility as well as a private opportunity. Without the full acceptance by the public of its responsibility, the private practice of forestry could not succeed.

Among the public measures mentioned were fire protection, reform of taxation and forest research.

Private Measures.—Private measures included the intensive practice of forestry by pulp and paper manufacturers so as to place their lands on a maximum producing basis. He did not advocate planting for very large areas, but suggested this as a supplement to other phases of forest management. The practice of forestry combined with integration with other woodusing industries—sawmill, mining and the various forms of chemical utilization of wood—offered the best possibilities of solving the problem of the pulp mill, particularly in mountainous regions.

In conclusion, Mr. Crocker said that forestry had a place in the pulp and paper industry because it was profitable for the industry and this was the chief justification for its practice. In time, the industry could be depended upon to provide its supplies of pulpwood on a profitable basis.

There was no discussion of Mr. Crocker's paper, and following some announcements by Alvin M. Smith, chairman of the Entertainment Committee, N. L. Nourse, of the Brown Company, was asked to present his paper on "Purity Factors in Wood Pulp and Their Relation to Paper."

Novelties in Chemical Wood Pulp

Starting with the premise that no paper is superior to the base fibre from which it is made, he said that until a few years ago chemical wood pulp was merely a white bleached fibre with as much length and strength as the cooking and bleaching process would allow; its production was a matter of uniform control of cooking and bleaching, having in mind the spoiling of as few cooks or bleaches as possible.

Coincident with the World War began the production of highly specialized wood pulps, influenced by a variety of factors, including the rapid growth of the rayon industry; the scarcity and high price rags; the use of wood cellulose in the manufacture of explosives and other conditions. Some new varieties of wood pulp were placed on the market, such as soft pulps, book pulps, easy-bleaching pulps, high-grade bond pulps, glassine pulps, silk pulps, and even a rag fibre substitute. As a result, the paper mill became accustomed to shifting pulps in place of changing beating and operating procedures, all of which advanced the knowledge of the papermaker regarding the suitability of a given pulp for a certain paper, and beating procedures became more standardized.

Efforts at Improvement.—"The whole effect was one which brought forth higher and higher grades of wood pulp paper. A general scramble for a ruling quality ensued. Manufacturers of paper mill equipment, including beaters, paper machines, etc., kept apace if not ahead of this progressive era. Makers of testing instruments devised better ways and means of determining when the quality of paper was right. These improvements placed our whole paper industry on a higher level of quality. But the most outstanding point in mind is the fact these suddenly crystallized improvements merely opened our eyes to the possibilities of the future in both paper and pulp lines."

Tests for Purity.—Mr. Nourse said the degree of purity of chemical wood pulp could best be recognized by its brightness of color and its alpha cellulose content. The dangerous impurities were named as (1) organic coloring matter; (2) unhydrolyzed wood gums, and (3) the oxidized by-products of the cellulose itself. Organic coloring matter develops a yellow or brownish tinge on the fibre, which grows darker with age, while unhydrolyzed wood gums are prone to oxidation and gelatinize on beating to form a brittle, tinny sheet. Wood gums in pulp are one of the causes of difference between easy bleaching and hard bleaching pulps. Cellulose degradation products from overoxidized conditions of cooking and bleaching do not effect the original color of the bleached pulp, but on ageing, the color changes and pulp of this type has a low alpha-cellulose content, since the degraded forms of cellulose are quite soluble in the alkali used for this test and are removed with the beta and gamma portions.

Rag Paper the Standard.—The approval of the ages has been stamped on rag papers because high-grade, new rag fibres possess a high white color as well as high alpha cellulose content. Before, however, a rag paper can be classed as a permanent and enduring bearer of records it must be known to contain cellulose of the highest color and alpha content, cellulose purity being the deciding factor and not the rag content *per se*. Chemical wood pulp of the past were inferior in stable alpha cellulose content to even the poorest of rags and were not therefore given serious consideration as raw material for permanent and durable papers.

All this has been changed, according to Mr. Nourse, by the advent of a high alpha-cellulose wood pulp, and rag content alone is not a guarantee of a superior lasting quality in a sheet of paper, unless that guarantee is backed by actual cellulose analysis or accelerated ageing tests.

Alpha-Cellulose Analyses.—Mr. Nourse cited the analyses of some characteristic papermaking materials to show their alpha cellulose purity. Of eleven samples of high grade new rags, the test showed a maximum of 98.35, a minimum of 93.68 and an average of 96.54 alpha-cellulose content. A mixture of medium grade new and high-grade old rags gave 96.68, 79.00 and 91.09 as the maximum, minimum and average degrees of alpha-cellulose purity, respectively. High alpha-cellulose wood pulp was rated at 94.00, 93.00 and 93.50, respectively; regular high-grade bond sulphite, 87.00, 85.00,

86.00; book sulphite 86, 82, 84 and soda pulp 84, 80, and 82.

Mr. Nourse said that medium grade rags were of questionable purity and would not insure permanent papers, the severe treatment to which they are exposed in cooking and bleaching being detrimental to cellulose purity, whether in rag, wood, straw, or any other type of cellulose. He thought there was some reason for believing that paper of the future may not be made along the more conventional fibre lines of the past.

The paper was discussed briefly by James G. Ramsey and Herb. W. Server, but nothing new was brought out, except a general acquiescence in the statement that the lower forms of cellulose are prone to gelatinize.

M. D. McNeille, who was on the program to present a paper on "The A. B. Wood Patent Centrifugal Pump for Paper Stock," had been unavoidably delayed by faulty railroad connections, and President Rooney asked M. F. Corin, of the Permutit Company, if he would not take Mr. McNeille's time and present his paper on "Reducing the Stack Loss" which was scheduled to be read by him on Saturday morning.

Reducing the Stack Loss

Mr. Corin showed a complete familiarity with his subject speaking almost extemporaneously, only referring to his notes occasionally to elucidate some of the lantern slides of apparatus or sketches and diagrams which were flashed on the screen. He spoke in an easy conversational tone that was heard clearly in all parts of the hall and made an excellent impression both for himself and his company. His paper appears elsewhere in this issue.

In the discussion which followed, Joseph H. Slater inquired if the Permutit Company would guarantee the operation of the Ranarex instrument, and Mr. Corin answered promptly with the word, "Absolutely." In response to a query by another member, Mr. Corin said the price of the Ranarex Co. Indicator and Recorder completely installed was $400.

H. C. Funsett asked if the Ranarex could be used to check a Bailey flow meter and was told that for this purpose the Ranarex was indispensable.

This concluded the business of the morning sitting and the meeting was then adjourned for luncheon.

SECTIONAL MEETINGS

On Thursday afternoon four separate meetings were held simultaneously in different parts of the hotel. The Chemical and Mechanical Pulp Section met in the Flemish Room on the mezzanine floor and the sections of Kraft, Book and Fine Writings and Board and Coarse Papers, respectively, on the sixth floor, in Rooms 692, 630 and 616.

John A. Bowers presided at the meeting of chemical and groundwood pulp superintendents at which papers were read on various phases of waste recovery and pulp manufacture. Mr. Bowers opened the proceedings by giving an account of the work which had been done in organizing the section and he distributed a list of pulp mill superintendents which indicated that an active membership propaganda was needed, because the proportion of members to non-members was quite small. He paid a compliment to Benjamin T. Larrabee who had done creditable work in bringing in new members. Joseph H. Slater commented on the value to the association of the pulp section and said it deserved the fullest support that could be given to it.

Waste Prevention

In the absence of Edward Eyre Hunt, of the department of commerce, who had been unexpectedly called to China, his paper on "Tendencies in Waste Elimination" was read by T. L. Dunbar, chairman of the Sulphite Pulp Committee. After a preliminary discussion of means and methods that have been proposed for doing away with waste, following the study initiated by Secretary Hoover when he was president of the American Engineering Council, Mr. Hunt considered the question of how the efficiency and the success of waste elimination could be measured. One way was to compare machine crew efficiency as shown by the monthly figures furnished by the News Print Service Bureau with the machine crew efficiency of those in mills represented at the meeting for which his paper was prepared. A rough and ready indication of progress would be available, he said, by taking the average efficiency figures of mills reporting to the News Print Service Bureau and measuring it against the average efficiency of all machines for the particular company having representatives at the present meeting. It was pointed out by Mr. Hunt in his paper that the paper industry keeps some of the best records of machine capacity and idleness now recorded in the United States. The papermaking machines of the United States had in 1926 a production capacity of 12,000,000 tons, and the idleness was 17 per cent. Since 1920 idleness had varied from 14 to 37 per cent, which he said might or might not be a good showing. He suggested that the record of each machine should be analyzed to see if time used in repairing breaks could be reduced, and other conditions analyzed and reported.

Importance of Reforestation.—Mr. Hunt gave some particulars of the work of the National Committee on Wood Utilization which has brought producers, distributors, and consumers of forest products together in a common body for exchange of views regarding wood utilization and wood using practices. The paper industry was dependent on reforestation for its future prosperity and progress and was interested in working out a program for making the best possible use of forest resources, which was the only way in which the industry could be assured of an adequate raw material supply.

Hints on Groundwood Production

Levi A. Fralick, of the Algonquin Paper Corporation, Ogdensburg, N. Y., which was the first mill to make more than 100 tons of paper on one machine in the course of a day, gave some practical hints on the burring of stones and screening of groundwood pulp in a paper entitled "Avoiding Waste in the Manufacture of Groundwood." Sharp burrs should be used and the stones kept properly trued up. If slivers are numerous in the stock from the grinder, the stone should be burred or dressed, and the same if a fine floury pulp is produced. The screening of groundwood is not attended to in some mills as closely as it should be; sometimes there is not enough screening capacity so that too much groundwood is forced into the screen with an insufficient amount of water, whereby a large amount of pulp is forced out as rejections and wasted. In other cases there is plenty of screening capacity but the required amount of water for the stock is lacking. To get the best results, 68,000 to 70,000 gallons of water are required per ton of pulp.

Mr. Fralick considered the closed system to be best but if some white water must get away then a good type of save-all should be used.

Pulping Hardwood by the Sulphite Process

The paper by Wesley M. Osborne on "Hard Wood—Its Use in the Sulphite Process" was read in his absence by William Weed.

In this paper, W. M. Osborne described the preparation of wood, strength of acid and bleaching procedure in the cooking of hardwood for sulphite pulp. A special chipper is used with rather blunt knives to make a regular ⅝ inch chip. The acid is generally made stronger, the Jenssen tower system being used. An average analysis showed 5.95 per cent total SO_2; 4.77 per cent free SO_2, and 1.18 per cent combined SO_2. The chips being heavier than those of softwood are not so easy to circulate in the digester. The pulp was dark in color, soft and of rather short fibre. In using a combined SO_2 of the high strength mentioned there is danger from liming. In a ten-hour cooking time the temperature for the first hour is 140° Fahr. and 10 gauge. Each hour the temperature and pressure rises until at the tenth hour there is a temperature of 300, the rise being more rapid in the last half of the period. Circulation is important in cooking hardwood. After circulation is started, the digester is brought up to pressure but the rise in temperature is retarded. Mr. Osborne said that a slow rise was best as the acid is readily absorbed by the chips and hard relieving should not be attempted in the early stages.

Method of Bleaching.—In regard to bleaching, this was best done in two stages. Bleaching affects the strength of the fibre injuriously. In his early work with hardwood a large consumption of bleach was required owing to the darker color of the pulp and the presence of what he called red spots

that looked like inner bark. He gave a few figures of strength tests, as follows:

Min. in Ball Mill	Strength	Freeness
15	25.6	3.46
25	46.55	3.13
35	40.66	3.08
45	36.99	2.56

The Freeness Test.—The figures for strength represent bursting test per square inch and the freeness as per cent per second. In reference to the freeness test Mr. Osborne made the following explanation:

"In ordinary freeness testing the cubic centimeters of water delivered from a known definite weight of fibre is called its freeness. This is true but to my belief and our practice the time that is required to deliver the water should be the freeness, time being the one factor which we must work with. Considering the speed at which the paper machine travels and the time available for removing the water from the stock going on the wire, we consider that this time should be a ratio to the freeness test."

How the Strength Increases.—Mr. Osborne then quoted some figures to show how the same stock increased in strength following a treatment after screening. The bursting strength was 40.25 as compared with 25.6 after 15 minutes treatment in the ball mill, while the freeness stood at 2.3. The strength went up to 53.52 after 45 minutes in the ball mill and the freeness figure was 2.91. After 55 minutes in the ball mill the strength registered 50.87 and freeness 2.40. The foregoing tests were made on unbleached pulp. After bleaching the strength declined, the highest figure after 35 minutes balling being 43.00, with a freeness of 3.61. The bleached pulp was freer and behaved better in the beater.

A yield of 1,100 lbs. per cord was reported and the alpha cellulose value of the pulp appeared to be extraordinarily high, according to Mr. Osborne's figures, the untreated unbleached pulp being credited with 92 per cent alpha cellulose; treated unbleached pulp, 93.33 per cent alpha cellulose. Bleached pulp after single bleaching appeared to yield 89.5 per cent alpha cellulose, and after stage bleaching, 92.33 per cent alpha cellulose.

A paper on the manufacture of sulphite pulp, with special reference to cooking procedure, was read by A. G. Natwick, general superintendents Lincoln Pulp and Paper Company, Merritton, Ont., was then presented.

Utilizing Spent Sulphite Liquor

W. E. Byron Baker was called on to read a communication on "The Recovery of Waste Sulphite Liquor."

The perennial question of utilizing sulphite cellulose waste liquor was the theme of W. E. Byron Baker's paper. In the cooking of a ton of sulphite pulp, a volume of liquor is produced containing in dissolved form a quantity of substance which in dry form weighs approximately 1¼ tons. This solution, as it comes from the digesters, has a concentration of 8 to 10 per cent dissolved dry matter, the average being perhaps 9 per cent. Each ton of pulp will then give 11 to 14 tons liquor discharge available and the magnitude of the problem becomes apparent when the thousands of tons of pulp produced daily in the United States are considered. He compared spent sulphite liquor with the coal tar of the coke oven that was formerly wasted, and he speculated on the valuable products that might be derived from waste liquors at some time in the future. The principal substances and their quantities contained in the ton and a quarter of dissolved matter produced in making one ton of sulphite pulp were lignin, 1,200 lbs.; carbohydrates, 600 lbs.; sulphur dioxide, 450 lbs., combined with lignin, lime and mineral matter, 250 lbs.; in addition to small quantities of resin and fats. He instanced some of the methods of utilizing sulphite waste liquor, including the making of binders or adhesives, tanning extracts, alcohol, and fuel.

Referring to methods of concentrating the waste liquor he gave an outline of the thermo-compression system used in Europe. Evaporation economies are obtainable with this system greater than those of other systems. The vapors from a single effect are compressed to just such an extent provides temperature elevation sufficient for rouse in the

Picture Taken at the Eighth Annual Meeting of the American Pulp and Paper

same effect at the required temperature difference, the compression being accomplished with an electrically driven compressor and the cost of current charged against the process. Where cheap current is available, the process is said to be quite economical, because with single effect operation, so far as steam consumed is concerned, it is possible to operate with the same economies as would be possible in a 12 to 15-body multiple effect.

Summing up, Mr. Baker said the problem of utilization was an economic one. The big future possibility lay in an ability to make some product entering into everyday life as an article of consumption. In Sweden, experiments were under way for the building of houses with a composition in which concentrated cellulose sulphite extract forms the larger part. It has been suggested to use the spent liquor as a fertilizer for the soil. Tilghman in the first days of the sulphite pulp industries had a scheme for utilizing it in this way. Sulphite liquor originated in the soil and it would seem logical, Mr. Baker said, to replace it as directly as possible.

A paper by C. L. Knowles, of the Dorr Company, New York, on "Continuous Causticizing in Soda and Sulphate" was read in his absence by A. Anable.

Making Improved Groundwood Pulp

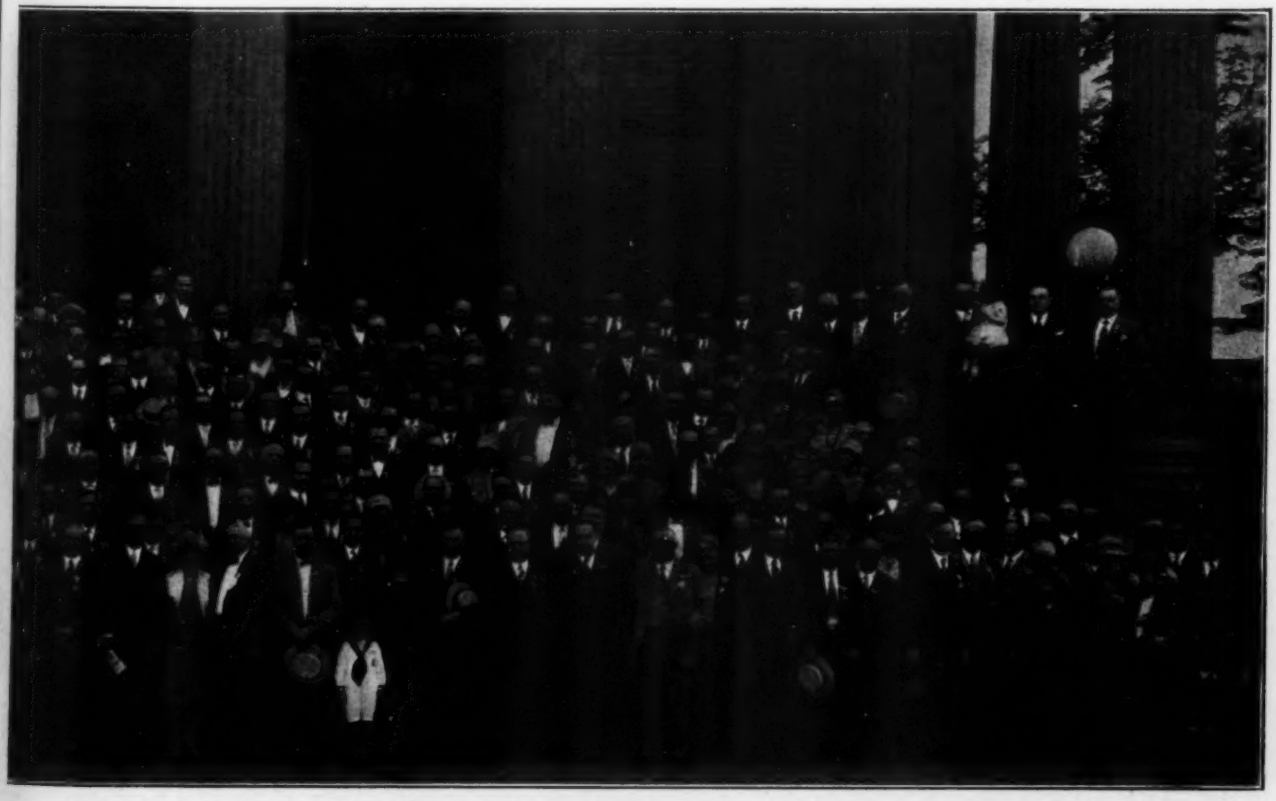
The paper by George K. Walker entitled "Some Phases of Groundwood Manufacture" was then called for.

In what he styled some personal observations, George K. Walker gave an account of improvements that had been effected in recent years in the manufacture of groundwood pulp so as to reduce the amount of "broke" in operating a newsprint machine. He mentioned that when Frank Holbrook took charge of the mill of the Great Northern Paper Company at Millinocket, Me., where eight machines of 152" width were running in one room, the machines would run quite satisfactorily for about three days a week and during the remainder of the week nothing but "broke" would be made. This was in 1910. By experimenting, Mr. Holbrook found he could make a better quality of pulp, keep the stock uniform and increase the production with the use of a threaded burr on the stones, the burr having ten threads to the inch. This according to Mr. Walker marked the beginning of the production of uniform pulp on a large scale.

The Hall-Ward Process.—A few years later the Hall-Ward process was developed at the mill of the St. Regis Paper Company. By using a left-hand spiral burr with teeth three-quarters of an inch apart followed by a right-hand spiral burr with eight teeth to an inch, a good long fibred pulp was produced which enabled them to reduce the amount of sulphite in making newsprint paper. With this combination of burrs it was difficult however to keep the pulp uniform on account of the roughness of the surface of the stones. When the pulp was too coarse and the waste excessive a brick was used to dull the rough edges, but this was unsatisfactory as the brick not only knocked off the rough edges but glazed the stone as well so that it had to be resharpened. Mr. Ward experimented further and found he could by using a fine diamond point burr with fourteen points to the inch get better results. But by using one left-hand spiral burr over the right-hand spiral burr it left the surface of the stone ragged and rough and the waste was still prohibitive.

Walker's Improvement in Burring.—Mr. Walker and his pulpmaker then conceived the idea of using a sharp diamond burr and running it over the stone quickly, but this gave a short, coarse pulp and to remedy it a No. 4 straight cut burr was used to make creases in the stone to drag or carry the coarse fibres which were ground in one pocket to and under and between the wood and stone in the next pocket. This method worked satisfactorily. With a stone speed between 210 and 225 r.p.m., with stones from 54 to 60 inches in diameter, using a pressure of about 32 lbs. per square inch the best quality of groundwood pulp could be made with 50 h.p. per ton. The customary speed of magazine grinders is 240 r.p.m. which necessitates the use of a hard stone and hard stones usually have fine grit.

Experience with Caterpillar Grinders.—The Oji Paper Company, of Japan, employed two Warren caterpillar grind-



Mill Superintendents Association, Richmond, Va., May 26, 27 and 28, 1927

ers running at 225 r.p.m. and the stones are faced with No. 4 straight cut burr with a No. 12 fine diamond point burr. They make pulp with an expenditure of 53 h.p. per ton, the pulp being of such a quality as to enable them to run their paper machines 750 ft. per minute, with 21 per cent of sulphite, making 28 lbs. newsprint. Mr. Walker said he had seen a statement that in a Canadian mill caterpillar grinders were being operated at 212 r.p.m., motor driven. The expenditure of power with these grinders was 1300 h.p. per stone but he thought that equally good pulp could be produced with 900 to 1,000 h.p.

Skeptical about Wide, High Speed Machines—Mr. Walker was skeptical of the savings effected by the use of very wide and high-speed newsprint machines, saying if the users of these machines would figure their extra cost for sulphite against their labor-saving it would not look so good. He declared that good newsprint paper could be made on machines running up to 500 ft. a minute, with 5 per cent of sulphite, providing the groundwood is made properly; from 500 to 600 ft., 10 per cent sulphite; 600 to 650 ft., 15 per cent sulphite; 650 to 750 ft., 18 per cent sulphite. But the groundwood must be fine enough and long enough to make paper at such speeds and percentages of sulphite. In order to get desired results the following precautions should be observed:

Precautions—Speed of stones not to exceed 3,350 ft. Surface of stone treated with a straight cut or spiral burr with very slim sharp teeth, four to the inch. If the creases are closer than a quarter inch the stone will break down between the grooves and slivers and waste will result. After the creases have been put in the face of the stone, a No. 12 or No. 14 diamond-point burr should be used very lightly and often to keep cutting surface of the stone smooth and sharp at all times. The pressure on a pocket grinder with a 14-inch cylinder should be regulated between 55 and 60 lbs.

Mr. Walker said that with this system the power consumption could be as low as 45 h.p. per ton.

BOOKS AND FINE WRITINGS

An interesting program of papers was presented by the Committee on Book and Fine Writings, W. S. Brooks, chairman, in Room 630. The first papers was by H. A. Helder, of the Champion Fibre Company, on "Use of Bleached Sulphate Versus Sulphite."

Use of Bleached Sulphate in Papermaking

Bleached sulphate pulp can be used to advantage in place of bleached sulphite pulp in the manufacture of certain papers and Mr. Helder's contribution to the subject proved interesting. The pulp was manufactured from pine wood at the Champion Fibre Company's mill, Canton, N. C., and one of the problems connected with its production was the control of bleaching. Pine sulphate requires to be beaten longer but with less pressure on the roll than sulphite pulp, but it must be handled skillfully both in beaters and jordans if the highest value is to be obtained from it. Mr. Helder cited the following strength tests of sulphate pulps bleached according to low density cold and hot methods and high density cold and hot methods. High density hot bleaching means a temperature of 100° Fahr.; high density cold, 80° Fahr.; low density hot, 110° Fahr., and low density cold, 80° Fahr. Details were given of densities and strength of pulps as follows:

Sample No.	Time Bleaching	Temp. of Bleaching	Density of Stock	Strength of Pulps 70 Min.	80 Min.	90 Min.
1	8 Hrs.	80° F.	4%	216%	234%	218%
2	2½ Hrs.	110° F.	4%	232%	240%	236%
3	4 Hrs.	80° F.	10%	232%	235%	232%
4	1 Hr.	100° F.	10%	216%	222%	221%

Alpha determinations of the bleached pulp gave a yield of 79 to 83 per cent.

Some interesting figures were given by Mr. Helder concerning the hydrogen ion values of the stock in process from the beater to machine head box. The pH value of stock to beaters was 6.8 and that of the stock in beaters, 7 per cent consistence, 6.0; after addition of size, the stock in beater registered 6.4, and with the alum added the stock became distinctly acid or 4.8; at the machine head box the pH value was 4.6. The proportion of size and alum used for a beater of one-ton capacity was size, 40 lbs., alum 30 lbs. No records of folding qualities, tensile strength or tear tests of the finished paper were made as a constant humidity room was not available, but Mullen tests averaged from 1 to 1½ points per pound calculated on a regular bond basis, 17 x 22 x 500.

The Position of American Paper Clays

After some remarks by George K. Hamill on "The Use of Glue in the Beater," Harold T. Edgar, of The Miner Edgar Company, presented an interesting paper entitled "An American Paper Coating Clay," which reviewed the history of the domestic clay industry from its early beginnings to the present time and contrasted the constitution of English paper clays, which are of primary or residual character, with American paper clays of secondary or transported character. His paper appears elsewhere in this issue.

The next paper on the program was rosin refining.

High Grade Rosin for Paper Sizing

In this paper C. E. Mueller reviewed some work that had been done by the Paper Makers' Chemical Company in the production of a special rosin for the manufacture of paper sizing. With a view of determining the characteristics of various grades of rosin, twenty-six samples labeled "G" quality were tested as received from the naval stores yards at Savannah, when some startling differences were developed, the amount of unsaponifiable material present in some samples being as low as 4 per cent, while others registered 18 per cent. The melting points varied by as much as 40° Fahr.; other factors, such as specific gravity, acid number, etc., showed similar differences, despite the fact that all specimens had been graded and placed on the market as "G" rosin.

How Rosin is Graded—After describing the ordinary methods of collecting rosin and turpentine, the system followed in grading rosin was outlined. A sample of the rosin is taken by cutting a one-inch cube from each barrel about six inches down and comparing this with color standards supplied by the Bureau of Chemistry of the Department of Agriculture. If a sample matches the "G" color standard, it is graded and sold as "G", regardless of its other physical and chemical characteristics. In grading rosin for paper sizing, at the plant of the Paper Makers' Chemical Company, Mr. Mueller said every step was controlled with the end in view of producing rosin which would not only come up to chemical and physical standards, but would also pass practical tests of its sizing value.

Making the Size—The next step in process was to convert a carefully selected and standardized rosin into rosin size, which was done by boiling the rosin with an alkali. If enough alkali is used to take up all the rosin neutral size is formed, and if less alkali is used so that some of the rosin remains uncombined free rosin size results. Neutral size is easy to handle and high free rosin size less easy, the free rosin having a tendency to separate out and cause rosin spots in the paper. In recent years emulsifying systems have been used to produce a rosin size of homogeneous properties that will cause less trouble to the papermaker. With the use of an efficient emulsifying system there is less danger of rosin spots appearing in the finished paper. If a good colloidal emulsion is available, the size not only mixes more readily with the stock in the beaters but by reason of its colloidal character it has increased covering power.

The closing paper at the sectional meeting of Book and Fine Writings Superintendents was a discussion of "Printers' Troubles with Fine Papers" by James J. Fulton, of Kohn & Pollock, Inc.

BOARD AND COARSE PAPERS

Charles L. Ellis, of the Downingtown Manufacturing Company, presided at the sectional meeting of the committee on Board and Coarse Papers, which shared the distinction with the newly formed Chemical and Mechanical Pulp Section of being the best attended and most interesting committee meeting of any held during the convention. The first paper on the program was an illustrated account of the K-B process of water-proofing by H. C. Avery, of the Flint Kote Company.

Flintkote Asphalt Emulsion

The use of asphalt in the manufacture of a waterproof board was interestingly described by Mr. Avery. As ordinarily understood asphalt would be impossible of use on a board machine, but when properly emulsified it can be mixed with fibres and felted into board. It is commonly but erroneously believed by many people that all asphalts have their source in an asphalt lake in Trinidad, but the truth is that natural asphalts of which Trinidad is one, carry so much foreign matter that their use is limited mostly to road construction. Neither is asphalt tar, as some think, for it has neither taste nor odor and while it resists alkalis and acids it is not greaseproof. Proper asphalts may be bought from any one of the larger oil refiners at a cost of about $16 to $20 a ton, a figure that is comparable to the price of paper stock.

Characteristics of Proper Asphalt.—Mr. Avery described the characteristics of the right kind of asphalt for use in making flintkote board and said that K-B asphalt emulsion was a permanent mixture of asphalt, clay and water in varying proportions, but containing approximately four pounds of solids to the gallon and 45 per cent of water, produced through rapid agitation in an emulsifier. This emulsion is used in the manufacture of other products besides waterproof board, one manufacturer turning out an imitation linoleum with it on a wet machine; various moulded products such as pails, tubs and toys are made with a mixture of asphalt emulsion and pulp sucked on to moulds. He enumerated a long list of uses for the K-B emulsion, which is a black buttery paste capable of being thinned to the consistence of a heavy cream by the addition of water.

How Asphalt Emulsion is Made.—Mr. Avery gave details of the method of emulsifying the asphalt as carried out at plants where waterproof board is made. The emulsion is pumped to the beater in the same way as any other sizing material and mixed thoroughly with the stock, first raising the roll off the plate. A coating roll, constructed on the principle of a small dandy, is used to supply the emulsion to the board machine. The dandy roll revolves in a box one foot square placed between the center cylinders, and the emulsion is carried up by the mesh of the dandy wire and spread on the wet plies of board in the form of a film. The asphalt film is then covered by the plies which follow. The roll is set so as to clear the normal travel of the felt by about an inch.

The Harvey-Lewellen Control Device

Following Mr. Avery's talk, Tom Harvey, of the Gardner-Harvey Paper Company, gave, by means of lantern slides and running talk, a most comprehensive account of the operation of an instrument for controlling the thickness of paperboard in the process of manufacture.

In describing the operation of the Harvey-Lewellen control device used in paper board manufacture, Mr. Harvey mentioned the complaints that used to be received from customers about variations in caliper of board before the control device was used. In work leading up to the use of the instrument, it was found that variations in thickness would ensue every time rolls were changed, and when the screen boy raked the screen the caliper would jump up about four points; the caliper would change even when the backtender oiled the machine. The Harvey-Lewellen control device makes a record of the thickness of board in process and relieves the machine tender of the nervous strain brought on by trying to keep the paper to the required thickness. In describing the instrument he said it had the appearance of a large micrometer and was usually placed between the last press rolls and the first dryer. At some convenient place, easily visible throughout the room, is a signal box containing three lights: red, white and blue in color. When the paper is on the machine and the instrument adjusted for the required thickness, the white light shows. If for any reason the paper varies .001 of an inch on the thick side, the red light shows and the instrument is so constructed that if the red light stays alight it will turn off stuff at the stuff box every three or four minutes until the board becomes the proper thickness. This operation is reversed if the paper for any reason becomes thin. If the red and blue lights flash on and off periodically, it tells the machine tender that something is causing the thickness to vary and he can set about remedying it. If the white light is on he knows that the caliper is running uniform and can give his whole attention to the running of the machine.

Technical Control and Good Engineering

In this paper by J. E. Blosser, of the Scott Paper Company, the effort was made to emphasize the importance of technical control, good engineering and cost control to practical superintendents. Mr. Blosser drew his own experience as one who had come up from the ranks. At first he was opposed to the idea of employing college graduates, but having learned from experience how useful a college trained man could be providing he was headed properly along practical lines, he took on two technical graduates and for three months employed them as third hands on the machine. Following this they were employed for three months in the beater room and then spent some time in the laboratory working on shrinkage and collecting information on the operation of savealls. They were next put on control work in the beater room where they made freeness and concentration tests, as well as tests of other variables.

The number of the college men employed was then increased to four, one being made head of the department and given the title of operating engineer. The suggestions which had come from the men as a result of their study of operations impressed the management so well that, as Mr. Blosser expressed it, the management started to back them.

Mr. Blosser Tells his Story.—After eighteen months, the laboratory and technical control departments of the mill were combined and the department now employs a staff of seven men who keep records of every operation in the mill. It may be well at this point to let Mr. Blosser tell his own story. Addressing this gathering of practical superintendents of paper mills on the subject of the technical man and his relations with the practical man in the mill, he said:

"Now comes the rub. Can you imagine these men telling a hard-boiled paper mill superintendent who has slept by a paper machine for at least twenty years of his life how to operate a machine? They can do it. These boys with their records can tell you just when and where your machines need attention. They can tell you when press rolls should be ground; they can tell you how long your felts ought to last; they can tell you the kind of felts and wires you ought to use, they can tell you how much steam your different crews are using to dry a pound of paper.

"After you have worked with them and found your troubles put them up to your engineering department with suggestions if you have any, get your engineers working with the technical control men; it is your job to tie these departments together. In fact to tie all departments together.

"Your next job is to get the work done right at the lowest cost, that is where the practical man comes in. He can handle men, he knows what to expect of men, he knows the short cuts to getting the job done and he knows when it is done right."

Cost Work Advocated.—He said it was surprising what the operation of a cost department would do in the direction of raising wages and at the same time cutting costs; and, so he advocated technical cost work.

Mr. Blosser said that in visiting some mills he had found superintendents with their old clothes on doing work that should be done by their assistants. Superintendents should never bother their heads with details but employ people to do this for them. With technical control established, and a good engineering department at work, the machines and other equipment of the mill could be kept up to date and the tissue business maintained on a larger scale.

In the course of the discussion, it was brought out that when the Scott Paper Company began to use technical men their output was only fifty tons a day and this had been increased to 100 tons. Mr. Blosser said that the technical man need not be a college graduate, for some of the best technical men had never seen the inside of a college.

Mill Men and Technical Men Should Co-operate.—Tom Harvey said that an effort should be made to establish a better

understanding between the mill men and the technical men, for unless this was done they would never get anywhere.

Chairman Ellis complimented Mr. Blosser on his paper, which he said was a valuable contribution to the proceedings of the association.

J. G. Ramsey deprecated the taking away of responsibilities from machine tenders and reminded those present that superintendents were recruited from the ranks of machine tenders.

Tom Harvey took a prominent part in the discussion and pleaded for a better understanding of the special work to be done in mills by technical men. He suggested to the superintendents present that in the handling of young men just out of college it was extremely inadvisable to bawl and cuss them out every time they made a slight mistake or failed to understand their instructions.

Other Papers

Following a paper illustrated by lantern slides in which C. W. Drake, of the Westinghouse Electric & Manufacturing Company described "Some Recent Developments in Paper Machine Drives," Vance P. Edwardes of the Forest Products Laboratory, Madison, Wis., read a paper by Sidney D. Wells on "The Testing of Sulphite Pulp for Folding Qualities."

Paper Mill Organization

The Board and Coarse Paper meeting remained in session till a later hour than any of the other committee meetings. It was brought to a close with a discussion of efficient paper mill organization by E. C. Gildenzopf, who said that the problems of paper mill organization had grown steadily in importance with the development of industrial enterprises, the refinement processes and increased business competition.

Let Workers Know Operating Costs.—Mr. Gildenzopf outlined some of the obligations of superintendents toward the men under them. It was the duty of the superintendent to see that workers under his supervision be given proper consideration by departmental foremen and that no partiality be shown. The superintendent should impress on the workers as well as their foremen that they must be as economical with their employers' property, or even more so, than they would be with their own property. Where workers have a knowledge of operating costs they are more likely to lower this cost by exercising greater care than if ignorant of it. The way to get this information to them was through the departmental foreman, which could be obtained by having the office manager prepare an itemized departmental cost statement to be submitted once a week not later than Friday of each succeeding week.

The superintendent should call a general meeting of his foremen for a discussion of itemized costs by departments and make a comparison of this cost with that of the preceding week.

At these weekly meetings the necessary week-end repairs to equipment should be taken up and listed. The presence of one of the chief executives at these meetings at least once a month was essential in order to keep him acquainted with the problems confronting the superintendent and his staff.

Safety Work Organization.—Mr. Gildenzopf emphasized the importance of maintaining an efficient safety organization in a paper mill plant, and he outlined a form organization as follows:

"The Safety First organization should consist of the following officers: chairman, vice-chairman, secretary, safety inspector, assistant saftey inspector, first aid attendant and visiting nurse.

"A Meeting must be held once each month. This should be attended by two representatives out of each department of the plant, including all department foremen, office manager and superintendent.

"The business brought before this meeting should be along the following lines:

(1) Reading of the minutes of the previous meeting.
(2) Weekly inspectors' report.
(3) All accident reports.
(4) New business. All new safety suggestions, careless practices, safety discussions, etc., come under this heading.
(5) Fixing date of next meeting and adjournment."

FRIDAY'S SESSION

A crowded business session was held on Friday forenoon, with the reading of papers and election of officers.

Value of Educational Classes

In the paper by J. Norman Spawn, educational director and employment supervisor of the Champion Fibre Company, the question stressed was, Is practical education in the fundamental principles of the job worth while? No matter how fine the equipment of a plant, its maximum value cannot be realized until the workman knows why his machine operates the way it does, and the more a worker knows about his job the more interested he will become in his work. The real problem, according to Mr. Spawn, was therefore to get the worker interested in his job. In various parts of the country, educational programs have been started in mills, perhaps the most ambitious of these being that undertaken in the Fox River Valley of Wisconsin. The workers proved so valuable there that the Wisconsin Vocational schools are planning an extension course in pulp and papermaking for the coming year. Likewise the Champion Fibre Company, of Canton, N. C., has, in co-operation with the Vocational Division of the North Carolina State Department of Education, established a system of vocational education for its employees. He presented copies of the report to be made and forms to be filled out by the workers and teachers. One of the benefits that follows from conducting classes is that a better feeling of fellowship and co-operation is engendered among superintendents, foremen and men. The men feel that the greater production they get out the more it benefits them as well as the company. In Spawn's opinion, plant educational classes are beneficial for executives and technical workers, as well as for the rank and file.

John S. Schumaker said there were great possibilities in classes for the training of workers and commented adversely on the tendency that still prevails in the industry to select men for leading positions on the basis of their technical knowledge, whereas the proper method in his opinion was to advance men as foremen and superintendents on the basis of their knowledge of men. In this way, instead of educational classes, it would be nearer the truth, he said, to call them classes in "humanics," a word that had been coined by himself.

Making White Paper and Making Paper White

Dr. August Merz, of the Heller & Merz Company, New York, followed Mr. Spawn with a paper on the art of color, in the course of which he threw discs of color on a screen and showed how the primary colors could be manipulated to give different tints in the manufacture of paper.

Dr. Merz put and answered the question, what is the difference between making white paper and making paper white? He said that if the stock could be bleached easily; if the manufacturing water was clean and free from iron; if the size was colorless and the alum pure, so that all conditions were right white paper could be made. If the stock was discolored and it would be unsafe to bleach it to the limit; if the water supply was dirty, the size dark and the alum full of iron, the paper could not be made white unless it got a coat of whitewash.

Explanation of Primary Colors.—That question and answer came after he had given a scie tific explanation of colors and had analyzed the component parts of pure white light. The colors of the rainbow were seven but the rainbow is simply white light unscrambled. White was the sum total of all colors.

Before demonstrating the blending of primary colors and showing filtration of light through color screens, he gave an elementary explanation of the three primary colors—red, yellow and blue. Thus if white light is allowed to pass through a red screen only the red portion goes through. If it is attempted to pass this red light through a green screen, the red is stopped, and since there is nothing but red there, and green stops the red, no light can go through, and you have nothing or black. If you take two from four two are left and if another two are taken from that nothing remains.

What Affects Quality of Color.—He then demonstrated the effect of altering the proportion of the three primary colors

that go to make white, the quality of which depends on the reflection of all the component parts in the same proportion as they were originally present. But then, what about the quantity reflected? He made a demonstration with sheets of white paper in single and double thickness. These sheets appear to be identical as to the quality of the light reflected but the thin sheet did not appear as white because it allowed more light to pass through and therefore reflected less.

Shades of Tinting.—The phenomenon of dyeing or tinting was then explained. When a sheet of paper is tinted it is deprived of its ability to reflect some color of the rainbow or spectrum. Something has been added to the paper which subtracts certain component parts of the white light shining on it. What is not absorbed or subtracted is reflected and registers a corresponding impression on the eye. The shade of the paper depends then on the quality and the quantity of white light reflected. "When your sheet is tinged with yellow, you try to correct that defect by adding colors which will cover up the yellow by absorbing more of the yellow component. Which simply means so much more light absorbed or so much less reflected. Less light reflected means a darker looking sheet. This carried to its logical conclusion means total absorption or no reflection. And no reflection means black. This after all is perfectly simple. Pure white is the sum total of the proper proportions of the three primary colors, while pure black is the total subtraction of the proper proportion of the three primary colors." A really fine popular exposition of color theory.

Effect of Exposure on Tints.—Dr. Merz then touched on some practical questions dealing with the color variations encountered in the tinting of paper owing to differences in the particular paper stock and the effect of ageing on a tinted paper. For really fine grades of paper ultramarine was deemed the best whitening agent, but it does not like alum. It was important to use all dyes in complete solution, the practice of shoveling the dry dye into the beater being bad, though acid colors will generally stand such abuse and so will auramine, but basic colors like malachite green, chrysoidine, bismarck brown, magenta, violet, and victoria blue should always be dissolved before being added to the stock. Hard water should be avoided as it causes trouble in dissolving colors and it is also the cause of sizing difficulties.

Dr. Merz concluded his interesting talk on color problems by showing moving pictures of the manufacturing plant of the Heller & Merz Company. With their aid a better understanding was gained of the operations involved in the production of different dyestuffs.

Pulverized Coal and Furnace Design

By inadvertence, President Rooney called on T. A. McGee to present his paper on the furnace design for pulverized fuel out of its turn.

Mr. McGee gave a lengthy and extremely interesting account of the chemistry of coal combustion with particular reference to the use of pulverized fuel and the type of furnace best suited for different effects. He also described the various types of furnace water cooling. He favored one or other of the following four types of cooling systems: Bailey Wall; Power Specialty Wall; Combustion Engineering Company Wall, and Furnace Engineering Company Wall.

Harry Williamson Gives a Practical Talk

Harry Williamson who is so well and favorably known as the author of "Lessons in Paper Making" which is published monthly in THE PAPER INDUSTRY got a great ovation on being called to present his paper on "The Degree of Hydration." It was near the close of a busy session and Mr. Williamson asked his audience whether they would prefer the paper in extenso or in abstract form. The vote was in favor of a summary or abstract, so Mr. Williamson plunged immediately into his subject. His complete paper is published on another page of this issue.

Committees Report

Before completing the program of papers, President Rooney announced that the committees on resolutions, audit, nominations and vocational education were ready to report.

For the committee on resolutions Chairman Ramsey submitted the following which were adopted by a vote of the association:

I—Reforestation.—Whereas, The American Pulp and Paper Mills Superintendents' Association appreciates the need of a definite and intensive reforestation program,

Be It Resolved, That we heartily endorse the program of the American Paper and Pulp Association in their reforestation program, and will be glad to co-operate with them in every possible way.

II—Resolution of Thanks.—Whereas, The American Pulp and Paper Mills Superintendents' Association keenly appreciates the splendid co-operation accorded them,

Be It Resolved, That Carl Magnus and his committee, and the members of the Southeastern Division, together with the Chamber of Commerce, the paper manufacturers and allied industries of Richmond and vicinity, be given a most hearty vote of thanks for their untiring work and co-operation in making our eighth annual convention one of the best in the history of the American Pulp and Paper Mills Superintendents' Association.

For the Auditing Committee, Chairman John A. Bowers reported having scrutinized a statement of the certified accountants which he believed to be correct.

An amendment to the by-laws was passed making a concession in dues to members elected subsequent to June of any year.

Officers Elected

The Committee on Nominations then presented the slate which had been agreed upon for officers to serve during the ensuing year, as follows:

President—Fred J. Rooney, The Upson Company, Lockport, N. Y.

Vice-Presidents—Benjamin T. Larrabee, S. D. Warren Company, Cumberland Mills, Me.; James G. Ramsey, Cherry River Paper Company, Richwood, West Va.; Carl Magnus, Standard Paper Manufacturing Company, Richmond, Va.; George H. Pountain, Allied Paper Mills, Kalamazoo, Mich.; Charles N. Mooney, Smith Paper Company, Lee, Mass.

Secretary—Robert L. Eminger, Miamisburg, Ohio.

Treasurer—Peter J. Massey, Wm. F. Hall Printing Company, Chicago.

On motion, the officers named were elected by one affirmative ballot.

Following a report by the Committee on Vocational Education, J. Norman Spawn, chairman, Harold G. Funsett, chairman of the Committee on Practical Problems, reported progress. He asked the members to feel free at any time submit problems and queries, either to him or Secretary Eminger, and they would receive prompt attention; but questions on pulp subjects should be sent to John A. Bowers, Hammermill Paper Company, Erie, Pa.

Herb. W. Server commended the work of the Practical Problems Committee and said it was the best move that had been taken of late to arouse interest in the affairs of the association.

Harry Williamson's Experience

Harry Williamson said there was a real need for a committee of this kind. He knew this by experience, for, always after the publication of his articles in THE PAPER INDUSTRY he would get anywhere from twenty-five to sixty letters with all sorts of queries for answer and problems to be solved. He wished it were more generally known that the association had a Committee on Practical Problems in order that he might be relieved of the burden of answering letters.

Safety Work in Paper Mills

W. J. Peacock, chairman of the Pulp and Paper Section of the National Safety Council, was down on the program for a paper on "Safety as a Production Factor in Papermaking," but on account of pressure of time, only a brief resume of his paper was given, and its full text appears on another page of this issue.

In the course of his extemporaneous talk he took occasion to commend the six months, paper industry safety contest conducted by THE PAPER INDUSTRY which, he said, was entitled to praise and thanks for its constant efforts to promote safety work.

The afternoon of Friday was spent in visits to paper mills and a historical tour of Richmond.

SATURDAY MORNING SESSION

The closing session of the convention on Saturday morning was opened by President Rooney at 10 o'clock, when E. F. Stemmler, of the Allis Chalmers Company, Milwaukee, Wis., was called on to present his paper on the use of the rod mill in pulp and paper work.

Use of Rod Mill In Pulping

In the ore grinding industry there has been used for ten years or more a form of grinding apparatus known as a rod mill. It consists of a hollow shell, charged with steel rods about two inches shorter than the inside length of the shell. The shell is nearly half filled with rods which lie loose and roll or tumble with the rotation of the shell in a horizontal position, thereby beating the material which is fed through hollow trunnions which form the supports at each end; the beaten or bruised material falls out by gravity from the end of the trunnion opposite to that through which the shell is fed. In this way Mr. Stemmler envisaged the new method of beating pulpable materials which has been the subject of considerable experiment at the Forest Products Laboratory of the United States Department of Agriculture, Madison, Wis., for the past four years.

The rod mills used for beating kraft pulp, chips and screenings are ordinarily lined with hard iron wave type liners and charged with high carbon steel rods. The operation is continuous and any materials fed to the mill are beaten or disintegrated and then discharged through the opposite trunnion, the rate of discharge depending on the rate of feed. When operating on an acid or bleached stock, rubber lining and a special rust resisting material for rods have been used to prevent contamination or discoloration of the finished paper that is likely to occur when iron linings and high carbon steel rods are used.

First Used by Fletcher Paper Co.—In a historical review of the introduction of the rod mill in pulp and paper work, Mr. Stemmler mentioned that the Fletcher Paper Company was the first firm to use the apparatus on a commercial scale. A 5x10 ft. rod mill and two beaters supply a paper machine at the mill in Alpena, Mich., which was originally supplied with pulp by three beaters. The lap pulp is broken down and beaten in the two beaters from which it is dropped into a stock chest and thence pumped up to the rod mill where it is hydrated at a consistence of about 2½ per cent in passing through it. The rolling of the rods has a strong hydrating action which imparts strength to the paper and gives it a better appearance and form than before the rod mill was used. The capacity of the rod mill varies from 15 to 30 tons every twenty-four hours, depending on the grade and weight of paper made. Numerous grades of paper are made at Alpena from both bleached and unbleached sulphite pulp. The power required is less than that consumed by a beater for the same amount of work.

At the plant of the Southern Extract Company, Knoxville, Tenn., two 6x12 rod mills have been installed, each with a capacity of about 1,400 lbs. of extracted chestnut chips per hour. This company has been a producer of tannic acid from chestnut chips for several years and until the introduction of the rod mill the chips were either thrown away or used as fuel in the furnace. Similarly in the mill of the Champion Fibre Company, Canton, N. C., two 6x12 rod mills have been operating for the last six months reducing fine chips and sulphite screenings, and a third rod mill is under construction. The capacity of the rod mill operated on screenings varies from five to eight tons daily, depending on the feed. Instances of other mills operating rod mills were reported.

It is necessary to operate the rod mill slowly when used for beating or refining since if the shell rotates too fast the rods are inclined to drop rather than roll down the surface of the rod bed.

When operating on fibrous material a rubbing or pounding action gives better results than when the material is subjected to certain blows or impacts. A screw feeding device has been used with satisfactory results to transfer the material to be beaten to the inside of the mill. There must be careful regulation of the water that is passed into the mill. If the consistence of stock is too dilute a cutting action may be imparted, while if too dense there will not be efficient rod action on account of a cushioning effect. A consistence of between 4 and 8 per cent was said to insure good operation.

Opinion Divided on Value of Rod Mill

In discussing the value of the rod mill, there was no general unanimity of opinion. R. J. Sprang, of the Champion Fibre Company, said the rod mill "was all right in spots." Three of them were used in his plant in the refining of sulphite, soda and sulphate screenings for the manufacture of container board. One could not expect to get the same results from a rod mill as could be obtained from a beating engine or jordan, its action being nearer to that of the old kollergang, which, by the way, gave splendid results. It was evident that Mr. Sprang placed the kollergang higher as a tool than the rod mill.

Wanted, a Groundwood Refiner

Joseph H. Slater spoke of the urgent demand for a machine that would satisfactorily reduce groundwood screenings. There was nothing in the industry for which a greater demand existed than a refiner for groundwood screenings.

Vance P. Edwardes spoke of his experience with the rod mill at the Forest Products Laboratory. One great objection to it was that it would reduce chips and screenings to slivers instead of squeezing or grinding them. It had been found impossible to reduce groundwood screenings in the rod mill and altogether there were so many variables to be encountered in its operation that it was difficult to speak of its future.

A New Stock Pump

The paper by M. D. McNeille on "The A. B. Wood Patent Centrifugal Pump for Paper Stock," which had been held over from Thursday's session was then read and its parts illustrated by lantern slides projected on a screen.

This new form of pump, originally used for the pumping of sewage, appears to be well adapted for the pumping of heavy stock, and several members made interested inquiries of Mr. McNeille, who said that the company's experience with paper mill operations had not been sufficiently large to make definite statements concerning the value of the pump for the work, though it was being used with satisfactory results at the Eddy Paper Mill, Three Rivers, Mich., for pulping wood pulp stock.

F. K. Becker gave a description of the Youngchild Wire Cleaner, as made by the Bird Machine Company, South Walpole, Mass., and he was followed by Philip S. Bolton, of the E. K. Mansfield Company, New York, who read a paper on the Laughlin Continuous Centrifuge, an apparatus intended for the filtration or concentration of liquids by centrifugal force. The machine consists of a bowl with a perforated shell and an inner screen mounted on a sleeve concentric with a hollow horizontal shaft. The bowl is rotated at a speed sufficient to settle the solids on the screen and throw the liquid through the perforations. To give a continuous discharge of the solid material, a screw impeller is mounted on the shaft and operated within the bowl. The machine is driven by means of a motor through a chain and sprocket on the shaft. It is suggested for use among other applications; for the concentration of pulp for high density bleaching; extraction of black liquor from soda and sulphate pulp and washing of pulp in one operation; extraction of bleach residues and washing the pulp.

Hydraulic Variable Speed Control

D. R. Francis, of the Waterbury Tool Company, Waterbury, Conn., presented a paper on "The Waterbury Hydraulic Variable Speed Control" which was copiously illustrated by means of lantern slides. The paper made a good impression on the superintendents present.

The Universal Hydraulic Variable Speed Gear, until recently known as the Waterbury Hydraulic Variable Speed Gear, is a mechanism that transmits energy by hydraulic means and does not refer to a toothed wheel, as the term "gear" is applied usually. Oil is the medium used for transmitting energy, and the mechanism consists of two units, a pump commonly called the A-end and a motor, or B-end. The pump is fitted with a control shaft whereby the operator is

enabled to control the speed of a motor unit. Each unit contains a revolving group consisting of main shaft, cylinder barrel, socket ring, pistons and connecting rods. Views of the various units and revolving groups were flashed on the screen and details explained by the representative of the Waterbury Tool Company.

In a short historical account of the development of this form of speed control it was mentioned that it was designed originally by Messrs. Williams and Janney about the beginning of this century, Mr. Williams being professor of machine design at Cornell University and Mr. Janney, chief engineer of the Waterbury Tool Company. The mechanism was used in the navy for controlling big gun turrets on battleships and for hydraulic steering gears on battleships and cruisers. During the war, conditions did not favor entering the industrial field but later, industrial installations were made. It is only within a year or two that paper mill men could be convinced that oil could transmit energy at a speed constant enough for their requirements. In 1924, the Hollingsworth & Vose Company put in a drive for their 84-inch four-cylinder paper machine at West Groton, Mass. Other paper mills followed suit, the Strathmore Paper Company equipping a Hamblet cutter in their Woronoco plant, and the Worthy Paper Company, at Mittineague, a drive for the variable line of a fourdrinier, while the Brown Company, Berlin, N. H., put in a drive on a machine making paper tubes for underground conduits. Several other developments of the year following were noted, the Parsons Paper Company, Holyoke, taking machine and cutter drives. Perhaps the most novel installation was at the Keith Paper Company's mill, Turners Falls, Mass. Mention of this was made in a recent issue of THE PAPER INDUSTRY. Part of the problem at Turners Falls was to install an 86-inch machine with drive in the rather cramped quarters previously occupied by a 60-inch machine. The installation and its various parts were shown on the screen. Much credit was given to Mr. Dunbar, chief engineer of the Keith Paper Company, for going ahead with what was a decidedly novel undertaking.

Modern Methods of Water Purification

The final paper on the program was "Modern Methods of Water Purification" by M. F. Corin, of the Permutit Company, New York.

After describing the various impurities in water represented by suspended matter and dissolved matter, Mr. Corin discussed the various methods of water purification by the settling, coagulation or filtering of suspended matter and removal of gases and other dissolved matter by the respective methods of aeration, heating, distillation, treatment by soluble reagents and contact with the insoluble reagent, zeolite. He gave a most interesting account of the methods employed in various situations for the purification of water and discussed the boiler compounds for the treatment of feed water. He has a rather poor opinion of the value of the advertised boiler compounds for the treatment of feed water and he disposed of many of their claims for efficiency in a summary fashion. He also discussed the operation of precipitation water softener plants, thus completing references to methods of treatment employing soluble reagents as a means of softening, before taking up a description of zeolite water softeners.

How Zeolites Act.—With zeolites, the hardness is removed from the water by the well known base exchange principle, the zeolite exchanging its sodium base for the calcium and magnesium bases in the water. In the operation of zeolite plants, a meter indicates when the softener has passed the quantity of water it was designed to soften. Regeneration of the zeolite bed is accomplished by passing a solution of salt (common brine) through the softener. The brine by a reverse exchange reaction gives its sodium base to the zeolite, and as it leaves the softener it carries with it in a clear solution the calcium and magnesium extracted from the zeolite. The zeolite is then rinsed free of brine and the softener is again thrown into service by opening the necessary valves.

Zeolite is a name derived from two Greek words meaning "to boil" and "stone," because most zeolites swell or boil up in a characteristic way when the flame of a blow pipe is applied to them. Today the name "zeolite" is applied to any base-exchange silicate.

Porous and Solid Zeolites.—An interesting summary of the work of chemists on the properties of zeolite and the chemical changes involved in the removal of hardness in water by passing the hard water through them were illustrated by chemical equations. The different types of zeolites are classified on the basis of their physical structure into porous zeolites and solid zeolites. Chemically, zeolites are hydrous silicates. The softening capacity of a solid zeolite of about ½-mm. grain size was stated as about 2,500 to 3,000 grains as $CaCO_3$ per cubic foot; with porous zeolites the capacity for softening increases to 10,000 grains as $CaCO_3$ per cubic foot and higher.

Indications for Use.—The water softening capacity of a bed of zeolite lasts from six to twelve hours. In explaining the uses of porous and nonporous zeolites, Mr. Corin said that in general the first named could be used advantageously for hard, clear waters such as well waters, while the solid or nonporous zeolites were best adapted to turbid waters. The advantage of using zeolites is that no sludge is formed nor are chemicals added. The zeolite, an insoluble reagent, reacts completely with the relatively small quantity of the salts of calcium and magnesium in the water.

Zeolites and Lime Compared.—A comparison was made of the results of zeolites and lime-soda in softening hard waters, as well as the cost of operation, and these favored zeolite in every particular, except that for the correction of temporary hardness the lime treatment was more economical; for permanent hardness softening is more economical by the zeolite process. There are cases where a combination of the chemical precipitation method and the zeolite process was advantageous, lime and soda ash treatment being recommended in combination with the zeolite process to reduce temporary hardness when the amount of hardness exceeds 25 grains to the gallon. A number of combined lime-zeolite plants are operated in different parts of the United States. The zeolite method of softening water is particularly adapted for collecting boiler feed water and improving the water supply of industries requiring soft water. In the paper industry particularly, the need for water free from color and turbidity is well known. In the process of deinking waste papers soft water is a desideratum, by its use soda ash can be saved and better results obtained generally.

Gift for President Rooney

Before adjournment, Carl Magnus presented President Rooney on behalf of the Southeastern Division with a leather-bound set of the Textbooks on Paper Manufacture, as prepared by a Joint Committee on Vocational Education of the United States and Canada. The set was to be delivered to Mr. Rooney at his home in Lockport, N. Y.

Character of the Meetings

After making a feeling acknowledgment of this gift, Mr. Rooney called attention to the character of the attendance at meetings and expressed regret that some mill owners had a wrong impression of the way in which the meetings were conducted, impressions that had doubtless been obtained from their experiences at annual meetings of the American Paper and Pulp Association in New York. All could testify that a high standard of behavior had been observed by the superintendents in attendance and that valuable results would follow from the papers and discussions.

Attendance at the Convention

The names of those who registered, together with the names of some late arrivals, are given herewith:

Emerson Ahles, Wausau Sulphate Fibre Co., Mosinee, Wis.; A. J. Allison, Miami Div., West Carrollton, Ohio; A. Anable, The Dorr Co., New York; Michael J. Argy, Cliff Paper Co., Niagara Falls, N. Y.; A. P. Atkinson, Wm. E. Hooper Sons Co., Philadelphia; H. E. Atkinson, Public Printers Offices, Richmond, Va.; H. C. Avery, Flint-Kote Co., New York.

C. J. Baker, Bedford Pulp & Paper Co., Big Island, Va.; Dr. H. P. Baker, American Paper and Pulp Association, New York; W. E. B. Baker, Continental Paper & Bag Co., New York; Francis L. Barstow, 80 Atlantic Ave., Fitchburg, Mass.; A. L. Beals, Newark, Del.; H. Bennett, Valley Iron Works, Appleton, Wis.; F. N. Beveridge, Hummel Ross Fibre Corp., Hopewell, Va.; James Beveridge, Richmond, Va.; Geo. L. Bidwell, Warren Mfg. Co., Riegelsville, Pa.; H. O. Bing, Paper & Textile

Machinery Co., Sandusky, Ohio; John Bingham, Dill & Collins Company, Frankford, Philadelphia, Pa.; Benjamin Bishop, Sonoco Products Co., Hartsville, S. C.; George F. Begnal, Baker Mfg. Co., Saratoga Springs, N. Y.; E. N. Bechard, Eastwood Wire Mfg. Co., Belleville, N. J.; Frances E. Bentley, Noble & Wood Machine Co., Hoosick Falls, N. Y.; F. K. Becker, Bird Machine Company, South Walpole, Mass.; G. L. Bennett, J. J. McCabe, Lathe & Mach., New York; W. H. Benzing, Champion Fibre Company, Canton, N. C.; E. E. Barrett, Mead Sales Co., Dayton, Ohio; Frank Ball, Manhattan Rubber Co., Passaic, N. J.; L. S. Barker, Downingtown Mfg. Co., Downingtown, Pa.; P. S. Bolton, E. K. Mansfield Co., New York; J. E. Blosser, Scott Paper Co., Chester, Pa.; George Bonner, Falls Mfg. Co., Oconto Falls, Wis.; John A. Bowers, Hammermill Paper Co., Erie, Pa.; F. C. Boyce, Wausau Paper Mills Co., Brokaw, Wis.; J. H. Braugham, Foster Box Board Co., Utica, N. Y.; L. H. Breyfogle, 319 W. Walnut St., Kalamazoo, Mich.; A. E. Bridge, Shartle Bros. Machine Co., Middletown, Ohio.; L. M. Booth, Booth Chemical Co., Elizabeth, N. J.; B. M. Briggs, Lawrence Paper Mfg. Co., Lawrence, Kan.; W. E. Blauvelt, Cameron Machine Co., Brooklyn, N. Y.; G. S. Brazen, Appleton Machine Company, Appleton, Wis.; F. E. Brown, Manchester Board and Paper Co., Richmond, Va.; Martin V. Brooks, Miamisburg Paper Co., Miamisburg, Ohio.; Wm. S. Brooks, Champion Fibre Co., Canton, N. C.; A. F. Brunell, Paper Makers Chemical Co., Holyoke, Mass.; Wm. Brydges, 763 Eighth Street, Niagara Falls, N. Y.; J. P. Bonardi, Mine & Smelter Supply Co., New York; P. E. Brown, Manchester Board and Paper Co., Richmond, Va.; C. R. Buck, Buck-Kaier Co., New York; E. Y. Burckhalter, Kalbfleisch Corp., New York; W. H. Burns, Valley Iron Works, Appleton, Wis.; W. J. Burns, Sonoco Products Co., Hartsville, S. C.; Stuart L. Burr, Waterbury Tool Company, Waterbury, Conn.; E. W. Bush, Crocker-McElwin Co., Holyoke, Mass.; Edward Butterfield, Gardner-Harvey Paper Co., Middletown, Ohio; W. H. Buxton, Philadelphia Quartz Co., Philadelphia, Pa.; R. A. Burroughs, R. A. Burroughs & Co., Norfolk, Va.

John Calder, Wrenn Paper Co., Middleton, Ohio; W. Carmody, Tennessee Paper Mills, Chattanooga, Tenn.; A. B. Clark, J. O. Ross Engineering Co., New York; Samuel Clayman, National Aniline & Chemical Co., Philadelphia, Pa.; James F. Collins, Bogota Paper Board Co., Bogota, N. J.; Col. R. K. Compton, Richmond, Va.; Charles E. Conley, Norwich, Conn.; M. F. Corin, Permutit Company, New York; John Cornell, The Paper Mill, New York; W. H. Croft, Esleek Mfg. Co., Turners Falls, Mass.; D. A. Crocker, American Paper and Pulp Association, New York; T. L. Crossley, Associate Editor, Pulp & Paper Magazine of Canada, Gardenvale, Canada; Lester W. Crouse, 75 Chestnut Street, Bogota, N. J.; Chris C. Crusius, American Voith Contact Co., New York; Wallie E. Cunningham, Mead Pulp & Paper Co., Dayton, Ohio.

W. T. Dabney, Richmond Chamber of Commerce, Richmond, Va.; J. Edwin Dewey, Whitmer-Parsons Pulp & Lumber Co., Philadelphia, Pa.; William Dickinson, Algonquin Paper Corp., Ogdensburg, N. Y.; Frank Dittmire, Gardner-Harvey Paper Co., Middletown, Ohio; H. S. Donald, Standard Paper Mfg. Co., Richmond, Va.; Harry W. Deffew, Standard Paper Mfg. Co., Richmond, Va.; J. Donaldson, Scandinavian Pulp Agency, New York; Franklin Dorset, Richmond, Va.; Robert Douglas, Ohio Knife Co., Cincinnati, Ohio; Joseph H. Dow, Eastwood Wire Mfg. Co., Bellville, N. J.; C. W. Drake, Westinghouse Electric & Mfg. Co., Schenectady, N. Y.; F. W. Drake, Lockport Felt Co., Newfane, N. Y.; Arthur B. C. Drew, The Pairpoint Corp., New Bedford, Mass.; Edward F. Driscoll, Smith Paper Co., Lee, Mass.; T. L. Dunbar, Stebbins Engineering Co., Watertown, N. Y.

Elmer R. East, Michigan Paper Co., Plainwell, Mich.; H. T. Edgar, Miner-Edgar Co., New York; Vance P. Edwardes, Forest Products Laboratory, Madison, Wis.; T. L. Edmonds, Wausau Paper Mills Co., Brokaw, Wis.; Frank Egan, John Waldron Corp., New Brunswick, N. J.; Ivar Ekholm, National Aniline & Chemical Co., New York; J. P. Ekberg, Chesapeake Corp., West Point, Va.; H. W. Ellerson, Albemarle Paper Mfg. Co., Richmond, Va.; Charles L. Ellis, Downingtown Mfg. Co., East Downingtown, Pa.; J. G. Ellison, General Dyestuff Corp., Philadelphia, Pa.; R. L. Eminger, Miamisburg, Ohio; C. M. Eshelman, Cameron Machine Co., Brooklyn, N. Y.

A. C. Ford, A. A. Simonds Dayton Co., Dayton, Ohio; George F. Forman, Schmidt & Ault Paper Co., York, Pa.; C. Spottiswood Foster, Bedford Pulp & Paper Co., Colemans Falls, Va.; James Foxgrover, Western Paper Makers Chemical Co., Kalamazoo Mich.; S. J. Fortune, Rochester Paper Co., Rochester, Mich.; Levi A. Fralick, Algonquin Paper Co., Ogdensburg, N. Y.; D. R. Francis, Waterbury Tool Co., Waterbury, Conn.; N. W. French, Hammermill Paper Co., Erie, Pa.; H. D. Frost, W. S. Tyler Co., Cleveland, Ohio; James F. Fulton, Baltimore, Md.; Harlow C. Funsett, Hagar Straw Board & Paper Co., Cedarville, Ohio.

W. W. Galloway, Hargar Straw Board Co., Cedarville, Ohio; J. C. Gayler, S. K. F. Industries, New York; Edwin H. Gibbons, The Smith Paper Co., Lee, Mass.; E. C. Gildenzopf, Congoleum-Nairn, Inc., Asbestos, Md.; W. L. Glass, B. F. Goodrich Rubber Co., Akron, Ohio; W. A. Gocke, Griley-Unkle Engineering Co., Fort Wayne, Ind.; A. C. Goolsby, A. C. Goolsby Paper Co., Richmond, Va.; Walter D. Gould, H. N. Hill & Co., Philadelphia; W. Greeley, F. C. Huyck & Sons, Albany, N. Y.; Harry W. Griffin, Taylor, Stiles & Co., Riegelsville, N. J.; M. J. Guild, Cuba; Marx Gunst, American Paper Co., Richmond, Va.; R. M. Guye, Philadelphia Felt Co., Philadelphia.

E. P. Hall, Standard Paper Mfg. Co., Richmond, Va.; George K. Hamill, U. S. Bureau of Efficiency, Bureau of Standards, Washington, D. C.; W. M. Hannum, The Richard L. Cawood Co., E. Liverpool, Ohio; H. R. Harrigan, Dist. of Columbia Paper Mfg. Co., Washington, D. C.; John A. Harlow, Penobscot Chemical Fibre Company, Great Works, Me.; R. W. Harrock, Escanaba Paper Co., Escanaba, Mich.; J. R. Hartman, Union Gas & Electric Co., Cincinnati, Ohio; H. D. Harton, Simonds Saw & Steel Co., Fitchburg, Mass.; A. D. Harvey, Nash Engineering Co., So. Norwalk, Conn.; Tom Harvey, Gardner-Harvey Co., Middletown, Ohio; J. L. Hayes, Bemis Bros. Bag Co., Peoria, Ill.; F. R. Henry, A. A. Simonds-Dayton Co., Dayton, Ohio; H. A. Helder, Champion Fibre Co., Canton, N. C.; John Herchar, John Strange Paper Co., Menasha, Wis.; Adolph Hess, Fibre Conditioning Co., Richmond, Ind.; Raymond Himes, Manhattan Rubber Mfg. Co., Passaic, N. J.; A. Hoen, Richmond, Va.; H. F. Hoffman, 729-60th Street, W. Philadelphia, Pa.; A. S. Hooper, Richmond, Va.; Everett F. Howarth, Simonds Saw & Steel Co., Fitchburg, Mass.; J. P. Hummell, Hummell-Ross Fibre Corp., Hopewell, Va.; Reginald Hunter, Standard Paper Mfg. Co., Richmond, Va.; Allen Hyer, Black-Clawson Company, Hamilton, Ohio.

T. H. Ireland, The Crane Co., Chicago.

S. W. Jacobs, Electro Bleaching Gas Co., New York; H. H. Jensenius, Daniel R. Hicks, New York; O. H. R. Johnson, Beckett Paper Co., Hamilton, Ohio; N. W. Johnson, Chesapeake Corp., West Point, Va.

Thomas J. Keenan, Associate Editor, The Paper Industry, New York; J. A. Kellogg, Jr., Mead-Patton Co., New York; R. H. Kelly, Marthon Paper Mills, Rothschild, Wis.; C. H. Kent, Kalbfleisch Corporation, Waterbury, Conn.; A. J. Kennedy, Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.; C. J. Kern, Moore & White Co., Philadelphia, Pa.; T. Kenneth King, 1114 Tribune Bldg., Chicago; Harry C. Kinnie, Bagley & Sewall, Watertown, N. Y.; L. F. Knickerbocker, Provincial Paper Mills, Ltd., Port Arthur, Ont.; Robert Knowles, Reading Paper Mills, Reading, Pa.; Robert F. Kohs, Detroit Sulphite Paper Co., Detroit; Edward Korman, Heller & Merz Co., Chicago.

Benjamin T. Larrabee, S. D. Warren Co., Cumberland Mills, Me.; O. E. Larson, Heman Manufacturing Co., Lancaster, Ohio; Homer H. Latimer, Beckett Paper Co., Hamilton, Ohio; Willard T. Libby, Brown Co., Berlin, N. H.; Herbert Lippitt, International Paper Co., New York; W. J. Livingston, Dexter Sulphite Pulp & Paper Co., Dexter, N. Y.; T. Lof, Hummel Ross Fibre Corp., Hopewell, Va.; A. J. Loman, Robert Gair Co., New London, Conn.; Charles J. Ludwig, Mead Pulp & Paper Co., Chillicothe, Ohio; Fritz Lueders, Siebold Machine Co., Dayton, Ohio.

William MacGregor, Bemis Bros. Bag Co., Peoria, Ill.;

James M. Mackin, E. C. Atkins & Co., Indianapolis, Ind.; J. E. Madere, Cherry River Paper Co., Richmond, W. Va.; Carl Magnus, Standard Paper Mfg. Co., Richmond, Va.; C. E. Macklem, Beloit Iron Works, Beloit, Wis.; E. K. Mansfield, Muirhead & Mansfield, New York; Louis C. Marburg, Marburg Bros. Inc., New York; I. J. Marcuse, Bedford Pulp & Paper Co., Richmond, Va.; M. E. Marcuse, Bedford Pulp & Paper Co., Richmond, Va.; J. G. Mason, Jr., The Miner Edgar Co., New York; Peter J. Massey, W. F. Hall Printing Co., Chicago; H. E. Maul, Ravenswood Paper Co., Long Island, N. Y.; H. C. Meyhew, S. M. Langston Co., Camden, N. J.; Ralph K. McCluskey, H. T. McCluskey & Sons, New Haven, Conn.; T. B. McDowell, 2526 Hanover Ave., Richmond, Va.; J. F. McKenzie, Don Valley Paper Co., Ltd., Toronto, Ont.; T. A. McGee, Furnace Engineering Co., New York; M. D. McNeille, Three Rivers Plant, Three Rivers, Mich.; Dr. August Merz, Heller & Merz Company, New York; A. A. Mintle, Valve Bag Company of America, Oakmont, Pa.; A. J. Monro, reporter; T. H. Morrissey, Shuler & Benninghofen, Hamilton, Ohio; C. E. Mueller, Western Paper Makers Chemical Co., Kalamazoo, Mich.; W. W. Maclan, The Black-Clawson Co., Hamilton, Ohio; John A. Murray, Wm. A. Hardy & Sons Co., Fitchburg, Mass.; Edward McWhirter, Provincial Paper Mills, Georgetown, Ont.; Lester S. McCurdy, P. O. Box 1011, Bradentown, Fla.; O. J. Mills, Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.; D. H. Montville, Shartle Bros. Machine Co., Middletown, Ohio; C. N. Mooney, Smith Paper Co., Lee, Mass.; Frank J. Mooney, Smith Paper Co., Lee, Mass.; Wm. C. Mooney, "In School," New York; C. H. Morgan, Lockport Felt Co., Newfain, N. Y.; F. J. Morrison, Hummel Ross Fibre Corp., Hopewell, Va.; W. H. Munson, Forest Products Laboratory, Madison, Wis.; J. M. Murray, Bogalusa Paper Co., Bogalusa, La.

C. H. Nable, A. E. Staley Manufacturing Co., Kalamazoo, Mich.; S. J. Naughtrip, Toronto Paper Manufacturing Co., Toronto, Ohio; A. G. Natwick, Lincoln Pulp & Paper Co., Merritton, Ont.; L. D. Nicholson, Dist. of Columbia Paper Mfg. Co., Washington, D. C.; Robert B. Nixon, E. C. Atkins & Co., Indianapolis, Ind.; J. H. Noble, The Oliver Continuous Filter Co., New York; K. H. Neblott, Standard Paper Mfg. Co., Richmond, Va.; Charles F. North, Green Bay Foundry & Machine Works, Green Bay, Wis.; N. L. Nourse, Brown Co., Berlin, N. H.

J. J. O'Brien, The Paper Mill, Boston, Mass.; Ellis Olsson, Chesapeake Corporation, West Point, Va.; Harry C. O'Neill, Oswego Falls Corporation, Skaneateles Falls, N. Y.; Seth Owen, Buck Hill, So. Richmond, Va.; J. W. Outerson, Paterson Parchment Paper Company, Modena, Pa.; John Owens, Jr., Fibre Conduit Company, Orangeburg, N. Y.

Walter E. Packard, Hammermill Paper Company, Erie, Pa.; George V. Parmentier, Tomahawk-Kraft Paper Company, Tomahawk, Wis.; Jacob Parent, Western Board & Paper Company, Kalamazoo, Mich.; W. J. Peacock, Northern Paper Mills, Green Bay, Wis.; E. L. Pemberton, National Aniline & Chemical Company, Charlotte, N. C.; Joseph E. Plumstead, Wilmington, Del.; L. D. Post, The Paper Mill, New York; E. M. Potter, S. K. F. Industries, Charlotte, N. C.; Fred H. Powell, Schwartzchild Bros., Richmond, Va.; James E. Powers, Ches. & Ohio R. R. Offices, Richmond, Va.; Ross Puette, Manchester Board and Paper Company, Richmond, Va.; Ordway Puller American National Bank, Richmond, Va.; Max Poyck, Heller & Merz Company, New York; E. L. Puffer, Heller & Merz Company, New York.

J. W. Raines, Holyoke, Mass.; J. G. Ramsey, Cherry River Paper Company, Richmond, Va.; Charles S. Raney, Midwest Box Company, Circleville, Ohio; G. F. Reale, Hooker Electro Chemical Company, New York; Paul L. Redlich, Rotospray Manufacturing Company, Chicago; Michael Redmond, Kalamazoo Paper Company, Kalamazoo, Mich.; C. F. Richter, Vera Chemical Corporation, Stoneham, Mass.; Thomas Rider, H. Waterbury Sons, Oriskany, N. Y.; J. R. Roberts, E. I. du Pont de Nemours & Co., Wilmington, Del.; R. R. Robertson, Champion Fibre Company, Canton, N. C.; William J. Robertson, Heller & Merz Company, New York; George Roeschek, Eagle Paper Company, Joliet, Ill.; George W. Rogers, Richmond, Va.; E. V. Romaine, General Naval Stores Company, New York; Fred J. Rooney, The Upson Company, Lockport, N. Y.; Edward Rootes, Cornell Wood Products Company, Cornell, Wis.; F. A. Royse, Underwood Paper Mills, Plattsburgh, N. Y.; James F. Ryland, Standard Paper Manufacturing Company, Richmond, Va.

V. Salmonson, Riordon Pulp Corporation, Temiskaming, Quebec; James Salter, Victoria Paper Mills, Fulton, N. Y.; Thomas H. Savery, Jr., Nash Engineering Company, Chicago; Carl J. Schmidt, E. I. du Pont de Nemours Company, Philadelphia, Pa.; Henry Schuh, Carolina Fibre Company, Hartsville, S. C.; John S. Schumaker, Lincoln, N. H.; Douglas E. Scott, The Adams Bag Company, Chagrin Falls, Ohio; W. H. Scott, Duriron Company, Dayton, Ohio; R. E. Sears, Shartle Bros. Machine Company, Middletown, Ohio; C. L. Schweickert, Bedford Pulp & Paper Company, Richmond, Va.; H. W. Server, Miami Paper Company, W. Carrollton, Ohio; William H. Sievert, Michigan Carton Company, Battle Creek, Mich.; Harry Sinclair, Bennett, Ltd., Canada; C. J. Slack, Adirondack Mineral Company, Carthage, N. Y.; Joseph H. Slater, Escanaba Pulp & Paper Company, Escanaba, Mich.; Alvin M. Smith, Smith Courtney Company, Richmond, Va.; Fred L. Smith, Paper Mill Engineering, New York; Jack Smith, Gardner-Harvey Paper Company, Middletown, Ohio; L. E. Smith, Nekoosa-Edwards Paper Company, Nekoosa, Wis.; Richmond W. Smith, Bird Machine Company, South Walpole, Mass.; Ward M. Smith, Philadelphia Paper Manufacturing Company, Manayunk, Philadelphia; J. Norman Spawn, Champion Fibre Company, Canton, N. C.; R. J. Spitz, General Naval Stores, New York; R. J. Sprang, Champion Fibre Company, Canton, N. C.; Edward L. Stansel, Provincial Paper Mills, Mille Roches, Ont.; John Howard Stansell, W. Carrollton Parchment Company, West Carrollton, Ohio; Stephen W. Smith, Bird & Son, Inc. East Walpole, Mass.; Charles H. Spangles, Standard Paper Manufacturing Company, Richmond, Va.; B. K. Steadman, Standard Paper Manufacturing Company, Richmond, Va.; E. F. Stemmler, Allis-Chalmers Company, Milwaukee, Wis.; R. C. Stewart, Shartle Bros. Machine Company, Middletown, Ohio; E. H. Stoddard, Appleton Woolen Mills, Appleton, Wis.; William E. Sullivan, Allis-Chalmers Company, Milwaukee, Wis.; William F. Sullivan, The Ruberoid Company, Joliet, Ill; A. Suter, Bogalusa Paper Company, Bogalusa, La.; William H. Sutherland, Penn Fibre Board Company, York, Pa.

A. A. Tanyane, Paper Trade Journal, New York; A. G. Tatnall, William E. Hooper Sons Company, Philadelphia; George Tennant, Hummel Ross Fibre Company, Hopewell, Va.; C. K. Textor, Northwest Paper Company, Cloquet, Minn.; P. F. Thackenthall, Phipps & Bird, Richmond, Va.; W. H. Theroux, The Paper & Textile Machinery Company, Sandusky, Ohio.

R. H. Undertown, Heller & Merz Company, Philadelphia.

George Voght, Wausau Sulphate Fibre Company, Mosinee, Wis.

C. L. Wagner, J. O. Ross Engineering Company, New York; Daniel J. Walsh, The Parker Young Company, Lincoln, N. H.; George K. Walker, Finch, Pruyn & Co., Glen Falls, N. Y.; C. A. Wardsworth, C. A. Wardsworth Company, New York; J. C. Watkins, Chesapeake Paper Stock Company, Richmond, Va.; C. O. Watney, Pacific Pulp & Paper Industry, Seattle, Wash.; N. S. Ware, Norristown, Pa.; R. M. Watts, Cheney Bigelow Wire Works, Springfield, Mass.; A. E. Waugh, United States Rubber Company, Philadelphia; W. J. Weed, Electro Bleaching Gas Company, New York; Julius Weiner, Standard Paper Manufacturing Company, Richmond, Va; Lewis E. Weiser, National Folding Box Company, New Haven, Conn.; Edward Weber, National Aniline & Chemical Company, Chicago; Fred B. Wells, Ohio Box Board Company, Rittman, Ohio; S. Carroll Wentz, P. H. Glatfelter Company, Spring Grove, Pa.; W. Weston, American Wringer Company, Woonsocket, R. I.; W. B. West, E. D. Jones & Sons, Pittsfield, Mass.; J. J. White, Victory Theatre Bldg., Holyoke, Mass.; Mark Whitman, Marathon Paper Mills, Rothschild, Wis.; W. H. Willard, National Aniline & Chemical Company, Charlotte Br., New York; S. C. Willey, Atterbury Bros., New York; D. B. Williams, Adirondack Minerals, Carthage, New York; A. O. Wightman, Knowlton Bros. Inc., Watertown, N. Y.; J. J. Williams, Halifax Paper Corporation, Roanoke Rapids, N. C.; H. Williamson, Champion Fibre Company, Canton, N. C.; R. E. Winfree, Richmond, Va.; Frank E. Winslow, General Electric Company, Philadelphia; Forbes Wood, Newton Paper

Company, Holyoke, Mass.; S. L. Wren, Roanoke Rapids Board Company, Roanoke Rapids, N. C.

John F. Yordy, Howard Paper Company, Urbana, Ohio; C. E. Youngchild, Nekoosa Edwards Paper Co., Nekoosa, Wis.

Ladies in Attendance

Among the ladies who took part in the social functions provided by the local committee on entertainment were the following:

Mesdames A. J. Allison, M. J. Argy, F. K. Becker, A. N. Beachard, George L. Bidwell, M. M. Bingham, George Bonner, F. C. Boyce, L. H. Breyfogle, W. S. Brooks, Ernest W. Bush, W. H. Buxton, John Calder, Herrick J. Counter, William H. Croft, R. S. Crump, Harry Deffew, W. M. Dickinson, H. S. Donald, J. H. Dow, Franklin Dorset, A. B. C. Drew, Edward Driscoll, T. L. Dunbar, E. E. East, J. G. Ellison, Harold T. Edgar, J. P. Ekberg, Charles L. Ellis, R. L. Eminger, L. A. Fralick, D. R. Francis, Francis Finsey, J. C. Gayler, Harry W. Griffin, Robert M. Guie, G. A. Hall, John A. Harlow, Hubert F. Hoffman, Florence M. Hooper, Reginald Hunter, J. A. Inge, T. H. Ireland, R. H. Kelley, C. J. Kern, Frank V. Lahey, B. T. Larrabee, O. P. McKee, R. L. McKnight, Carl Magnus, I. J. Marcuse, J. Gilbert Mason, August Merz, D. M. Montville, F. J. Mooney, A. G. Natwick, E. H. Neblett, C. H. Noble, A. A. Otens, John Owens, jr., E. L. Puffer, J. Parent, L. D. Post, Joseph E. Plumstead, J. W. Raines, Cora E. Ramsey, Edward Rootes, George Roeschek, J. O. Sauter, R. E. Sears, Joseph H. Slater, Carl Smith, L. B. Smith, S. W. Smith, L. E. Smith, Ward M. Smith, William H. Sutherland, E. B. Tanyane, George Voght, George K. Walker, Fred Wells, N. B. West, J. J. White, A. G. Wightman, Harry Williamson, Frank Winslow, Forbes Wood, C. E. Youngchild, John T. Yordy.

Misses Catherine Argy, Gertrude Boyce, Elizabeth Byrne, Dorothy E. Drew, Eva M. Guild, Helen U. Kiely, Louise E. McGrath, May Mooney, Bessie Mooney.

Chicago Meeting of Paperboard Industries

Members of the Paperboard Industries Association convened at the Congress Hotel, Chicago, May 18 and 19. The meetings were well attended, and much constructive work accomplished.

Paperboard Group

The Paperboard Group meeting was held May 18, vice-president W. J. Alford, Jr., presiding. He submitted an interesting report referring to conditions in the paperboard industry and stressed the advantage of up-to-date information regarding situations in the industry.

Comprehensive reports were submitted by committees on the promotion of stabilization in quality and supply of waste paper. Statistical subjects were discussed in detail, and ways and means suggested for making this branch of the association of greater value. Certain changes were authorized in connection with the statistics on pulp, this latter report having already shown the unbalanced condition between demand and supply in the pulp stocks.

Consideration was given to a request received from the Department of Commerce for a check of Simplified Practice Recommendation No. 44, relating to boxboard thicknesses. To develop this information, a questionnaire has been sent to all boxboard manufacturers, members and non-members, and return of the questionnaire is urged. Vice-president Alford was authorized to appoint a nominating committee to present nominations at the July meeting for a member of the Executive Committee, representing the paperboard group. Several subjects of interest to the paperboard industry were referred to the Research Committee for study.

Folding Box Group

The Folding Box Group met the afternoon of May 18 with vice-president H. S. Hinkle presiding. He made some interesting statements about conditions in this branch of the industry, and commented upon the value to be derived by the members from attending assbciation meetings.

A detailed report was submitted showing recent accomplishments in extending the use of folding boxes. The meeting also gave consideration to the subject of warehousing finished goods. Report was made that the association's statistics now represent 90 per cent of the total tonnage of the entire Folding Box Group. Grafton Whiting, statistician, reported on work to date in the preparation of the uniform cost and estimating manual for the folding box industry. Other subjects discussed were: Folding Box Group statistical charts and summaries; depreciation survey; research problems; (starch coated boards, glassine paper lined board, adhesives for folding boxes), and a summary of operations for 1926.

Container Group

Vice-president Irving Hill presided at this group meeting, held Thursday morning, May 19. General Manager Browder submitted a report of container subjects with especial mention to the following: Figures to be shown in Circle Certificate of Boxmaker; packing requirements of fragile articles; boxbags as shipping containers; knit goods in over-size and overweight boxes, and writing paper, printing paper, etc., in fibre containers. There was a report on co-operation with National Industrial Traffic League in dealing with Steamship Conference Committees, and check of shipments on the docks by a representative of the association.

Report on explosives matters was given concerning the hearing before Interstate Commerce Commission, May 11, and apparent approval of recommended specifications for corrugated boxes for shipment of paint, varnish, shellac, etc.

E. R. Hankings, reported for the statistical-accounting committee on the following: Statement of operations for 1926; importations of strawboard; depreciation survey; cost accounting, and charts and summaries.

Joint Meeting of Three Groups

Irving Hill of the Lawrence Paper Mfg. Co., Lawrence, Kansas, presided at the meeting of the three groups. The report of action and recommendations of the Executive Committee included the following: Finances; program for summer meeting, and effort to increase membership.

In connection with the report on sales promotional work a moving picture showing the packing and shipping of writing paper in fibre boxes was given. There was a trade customs and practices Committee report following this picture.

The Standardization Committee was asked to consider a possible revision of specification No. 6, test container board standards, reading as follows:

"No. 6. Waterproofing:

> "A board to be considered 'waterproof' must, when folded into tray form and suspended, hold water for a period of three hours without showing moisture on the opposite surface, except where sand holes appear."

John L. Barchard, president, Hummell & Downing Co., Milwaukee, attended the annual meeting of the Chamber of Commerce, Washington, D. C., as official representative of the association. His report was read and received with interest.

E. R. Hankins reported consideration to a proposal to enlarge the association staff so as to render cost accounting assistance to member companies. As a part of this committee's report, Dr. E. O. Merchant, Economist, submitted an interesting report on "General Business Conditions in the Paperboard Industries."

General Manager Browder submitted a report covering the major activities of the association during the past two months, with special mention to the following subjects: Effort to increase membership; traffic and classification matters; relations with American Railway Association; research and laboratory reports; sales promotion and publicity, and observations with respect to general business conditions. Chairman J. J. Brossard submitted a progress report on research questions, reference being made to stream pollution.

The next meeting of the association will be held in the East on July 20 and 21. The hotel at which it will be held will be announced later.

The General Electric Co. has announced a five per cent reduction in prices of distribution transformers and small power transformers, effective June 1. This reduction is the sixth since 1920. On certain types of large transformers, reductions which average five per cent for this class of product have also been made.

Reducing the Stack Loss

By M. F. CORIN

THE strong competition of our present age is forcing every manufacturer to run his plant in the most economical and efficient manner. The cost of power and heat are in general a considerable part of the total manufacturing costs. Nevertheless, in many plants which are otherwise modern, the boiler house is neglected. Fig. 1 shows what the average boiler plant actually does and what it can and should do.

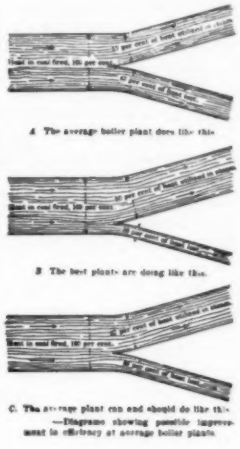


Figure 1

In those plants that are keeping pace with engineering progress, there is a clear tendency towards larger boiler units operating at higher working pressures and higher ratings than heretofore. Thus we have one modern boiler in operation where we had several boilers 10 or 20 years ago. With such a great increase in the fuel consumption of each boiler unit, it is more apparent than ever that it pays to check up on the operating conditions of each boiler in order to maintain all adjustments at the point of maximum efficiency. Thus, much of the auxiliary equipment which would not yield a profitable return on the small boiler at low rating pays such dividends on the large modern boiler that it becomes an economic necessity.

Boiler Heat Losses

There are three groups of losses in steam boilers (see Fig. 2). The first group is the loss due to unburned carbon in the ashes, amounting to about 2 to 6 per cent. As a rule this loss is high with coals having a high ash content. A minimum ash loss is obtained by burning the right quality of coal on the right type of grate.

The second group is the radiation loss, which averages about 4 per cent. With very large boilers operating at high ratings this loss may be as low as 3 per cent, whereas it may even reach 10 per cent if a boiler is operated at very light load. In order to keep the radiation loss low, boilers and steam piping should be well insulated.

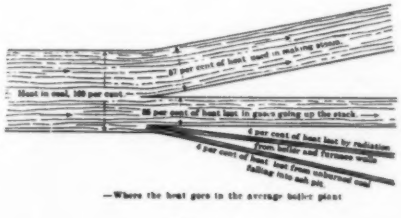


Figure 2

The third group is the stack loss, that is, the heat in the escaping flue gases. This deserves all the attention of the operator, since he can control the magnitude of this loss to a great extent by maintaining proper operating conditions. In the average industrial plant of even 1,000 to 2,000 horsepower this loss amounts to about 26 per cent of the total heat in coal fire, and it is much larger than all the other boiler-room losses put together. However, by intelligent regulation of the air supplied to the furnace, this loss can be readily cut in half, resulting in net fuel savings ranging from 10 to 20 per cent.

Principles of Combustion

To properly regulate the air supplied to the furnace, it is necessary to understand the principles involved in combustion so as to apply them correctly in each specific case. When combustion takes place the carbon of the fuel unites with the oxygen of the air to form CO_2 (carbon dioxide). This reaction generates heat and most of this heat is transmitted through the heating surfaces to the water in the boiler. The weight of the flue gas (products of combustion) per unit weight fuel depends upon the amount of air supplied to the furnace. The heat remaining in the flue gas, which usually escapes at a temperature of 400°-500° F., is of course, lost as the gas passes out of the stack. It is obvious, therefore, that it is desirable to keep the weight of this flue gas as low as possible.

If insufficient air is supplied, incomplete combustion takes place; that is, some of the heat is wasted because the carbon burns only partially to carbon monoxide (CO) whereby only one-third of the available heat is liberated, and some carbon is entirely wasted because it does not burn at all, but leaves the furnace as smoke. The object is, therefore, to feed enough air to completely burn the fuel and at the same time avoid any unnecessary excess which passes up the stack carrying off heat units.

In actual practice it is always necessary to use some excess of air above the theoretical amount in order to obtain complete combustion. This is due to the fact that it is impossible to obtain perfect mixing of each fuel particle with the air required. Thus it is necessary to feed a certain excess of air to the furnace in order that there will be enough oxygen in contact with each particle of carbon to burn it completely.

Where the fuel is burned on a grate, a comparatively large excess of air is required. Where the fuel is finely divided and well mixed with the combustion air, as with powdered coal, oil, or gas, it is possible to obtain complete combustion with a small excess of air close to the theoretical amount required.

It is a simple matter to recognize when there is insufficient air supplied: the appearance of smoke is the most common indicator of incomplete combustion. But in some installations incomplete combustion is indicated by the presence of carbon monoxide only and it is therefore necessary to make a test on each boiler in order to determine the minimum excess air required for complete combustion. Thus the point at which smoke or CO or both begin to appear in the flue gas may be taken to indicate the correct amount of air required for that boiler.

However, when complete combustion is assured by a sufficient excess of air, it is still possible that an unnecessarily large excess of air is being supplied, thus wasting heat by increasing the weight of the gases passing up the stack. It is not possible to differentiate between the correct excess air and more than the correct excess by ordinary observation and it has therefore become necessary to develop a special guide to make possible proper regulation of the air supply.

When this guide indicates to the fireman that the air supply is excessive, he throttles the damper or slows down the fan to decrease the air supply. If this procedure does not produce the desired results, there are probably leaks in the boiler settings which should be repaired in order to prevent air from seeping into the boiler where it absorbs heat and carries it up the stack.

Boiler room conditions demand certain requirements of such an instrument. It should respond rapidly to all changes, and it should not be affected by atmospheric conditions nor by boiler operating conditions, such as the physical condition of the boiler. It is also essential that this instrument be of simple, rugged construction to stand up under the severe boiler room conditions; and that it can be operated by an untrained man. This latter point is of especial importance in smaller plants where no highly skilled instrument men are available.

Two principles have been applied for the construction of such a combustion efficiency meter: the method of measuring air and fuel supply, and the method of analyzing the products of combustion.

Measuring the Steam Flow-Air Flow Ratio

Fuel as well as air supply is quite difficult to measure, and substitutes have been found in the steam output of a boiler, and the flue gas flow, respectively. The average steam production of a boiler is directly proportional to the product of fuel quantity and heating value, as long as the boiler effi-

[1]Presented at the eighth annual convention of the American Paper and Pulp Association, held at Richmond, Va., May 26, 27, and 28, 1927.

ciency does not change, and for a given excess air the weight of flue gas is also very nearly proportional to the same product. Therefore, the ratio of flue gas flow to steam flow is an indication of the amount of excess air supplied to the furnace.

Instruments operating on this principle are commonly known under the name steam flow-air flow meters, and they are manufactured by the Bailey Meter Company (Fig. 3). The steam flow is measured by an orifice, and the flue gas flow

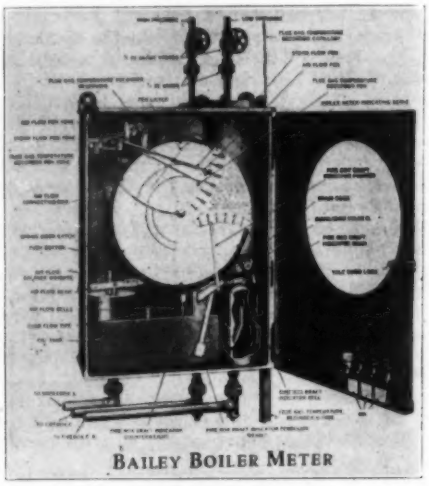


Figure 3

by using the pressure drop through the boiler. Both steam flow and air flow are recorded on the same chart and the flue gas flow recorder is set so that the flue gas flow record coincides with the steam flow record when the desired excess air is obtained.

The accuracy of the steam flow-air flow meter is influenced by a number of factors. First of all, a considerable error is caused by soot and ash deposits in the boiler passes, which decrease the area of the gas passages so that for the same pressure drop indicated on the chart there is really less gas passing through the boiler. Further inaccuracies are due to variations in pressure and in humidity content of the combustion air, changes in fuel quality and in flue gas temperature, and finally leaky baffles and boiler settings. Therefore, it is necessary to check the accuracy of a steam flow-air flow meter at short intervals by means of flue gas analysis, and to readjust the flue gas flow setting frequently in order to obtain correct readings.

Analyzing the Flue Gases

As stated previously, when a fuel burns, its carbon unites with the oxygen of the air to form CO_2 (carbon dioxide). Atmospheric air contains 21 per cent oxygen and 79 per cent nitrogen by volume; thus if carbon is burned with the theoretical amount of air, equal to 100 unit volumes, the 21 volumes of oxygen are converted to 21 volumes of CO_2 and the resultant mixtures contain 21 per cent CO_2, the remainder being 79 volumes of inert nitrogen of the air.

If, however, more air is supplied than theoretically required, only part of the oxygen is converted into CO_2 and the products of combustion, or flue gas contain less than 21 per cent CO_2. It follows, therefore, that as the excess air is increased the CO_2 content of the flue gases decreases. Thus the CO_2 content of the flue gases is a direct measure of the ratio of air supplied to fuel burned. This fact has been so widely used that engineers have become accustomed to speak of the excess air in terms of CO_2.

However, for various classes of fuels (coal, oil, etc.) a certain CO_2 content corresponds to varying percentages of excess air. This is due to the fact that hydrogen, which is present in all fuels in varying quantities, consumes part of the oxygen of the air and forms water vapor. Thus the theoretical maximum CO_2 content for fuels used in practice is less than 21 per cent, and the higher the hydrogen content of the fuel the lower the theoretical maximum CO_2 content of the flue gas.

The relation between efficiency and CO_2 content in the flue gas of a coal fired boiler is shown in Fig. 4. This diagram is only to be taken as an example and can not be applied to every installation. The CO_2 content, corresponding to maximum efficiency varies all the way from about 10 to 17 per cent according to fuel and equipment used, and, as stated previously, this optimum CO_2 content must be determined by test.

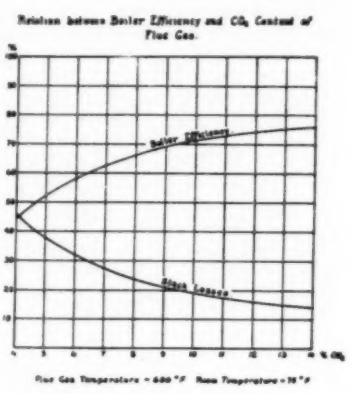


Figure 4

For making a flue gas analysis the simple and inexpensive Orsat apparatus is used (Fig. 5). A definite volume of flue gas, usually 100 cc is sucked into a measuring burette. Then this gas sample is brought in contact with KOH (caustic potash) solution whereby the CO_2 is absorbed. The sample is taken back to the burette, and the decrease in volume which is

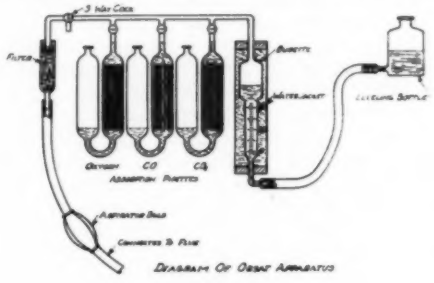


Figure 5

equivalent to the original CO_2 content is noted. Similarly, the CO and oxygen content are determined by using cuprous chloride and pyrogallic acid solutions respectively.

The Orsat apparatus is only suitable for testing and checking purposes, but as a continuous operating guide an automatic instrument must be used. As stated previously the CO_2 content need only be determined during a test run in order to establish the most efficient excess air for a given boiler. Having determined this it is only necessary to measure the CO_2 continuously in order to maintain the correct conditions. Various types of CO_2 recorders have been designed for this purpose.

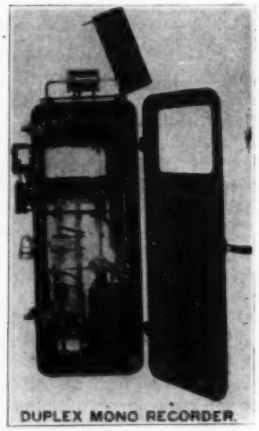


Figure 6

Chemical CO_2 Recorders

A great number of different makes of automatic CO_2 recorders are based on the Orsat principle. They are usually driven by water pressure or electric motors, and make on an average of 20 analyses per hour. The most noted instruments of this type are made by The Foxboro Co., The Hays Corporation, the Republic Flow Meters Co., and the C. J. Tagliabue Mfg. Co. (See Fig. 6).

In the Uehling CO_2 recorder which also belongs in this group of chemical instruments, a somewhat different principle is used. A continuous current of the gas to be tested is passed through a chamber filled with caustic potash flakes.

Due to the absorption of the CO_2 by the caustic potash the specific volume of the gas sample is decreased, thus causing a drop in pressure in the absorption chamber which is used as the means of indicating the CO_2 content.

Electric CO_2 Recorders

The principle of electric CO_2 recorders which were developed more recently is based on the thermal conductivity of gases (Fig. 7). An electric current is caused to flow through two platinum wires arranged in a Wheatstone bridge circuit. One wire is in a chamber into which flue gas diffuses and the

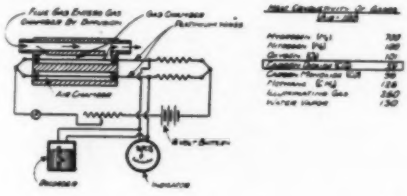


DIAGRAM OF ELECTRIC CO_2 RECORDER

Figure 7

other in a chamber containing atmospheric air. The heat generated in the wires, by the current, is transmitted through the gases to the walls of the chambers, and as gas containing CO_2 transmits the heat less readily than the air, the wire in the gas chamber becomes hotter than the one in the air chamber. This causes a corresponding change in resistance of the platinum wire which unbalances the circuit and causes a deflection of the galvanometer to an extent depending on the percentage of CO_2 present.

Electric CO_2 recorders are sold by the Bachrach Industrial Instrument Co. (Siemens and Halske Type), the Brown Instrument Co., The Cambridge Instrument Co., C. Engelhard, Inc., and the Leeds and Northrup Co. The various instruments differ somewhat in design but the general principle applied is the same in all of them.

CO_2 Recorders Based on Gas Density

The specific weight of flue gas increases in proportion to its CO_2 content, CO_2 being about 50 per cent heavier than the other constituents of the flue gases. This fact was used as the basic principle for CO_2 recorders as early as 40 years ago. Such gas balances were designed by Lux, Arndt and others, but since the specific weights of gases are very small, these instruments were so delicate that satisfactory results could not be obtained under the severe operating conditions of the boiler room.

Figure 8

In 1923, the Ranarex CO_2 Indicator and Recorder (Fig. 8) was placed on the American market by The Permutit Company and in this machine these difficulties have been overcome. In order to obtain a substantial force as a means of measuring the specific weight of the gas, a rotating motion is imparted to the flue gas by means of a motor driven fan revolving in a chamber (see Fig. 9). This fan drives the gas against the blades of an impulse wheel located opposite the fan in the same chamber and thus produces a torque on the shaft of that impulse wheel, this torque being proportional to the CO_2 content of the flue gas.

In order to eliminate the influence of changes in fan speed, temperature, humidity and atmospheric pressure, a comparing torque is produced on another impulse wheel by air to which a rotary motion is imparted in a second chamber by means of a second fan driven by the same motor. This fan, however, rotates in the opposite direction to the flue gas fan.

The two impulse wheel shafts are coupled together by means of two levers and a connecting link. This coupling system prevents complete rotation of the impulse wheels, but the difference in the two opposing torques causes a limited movement of the system which is transmitted to a pointer

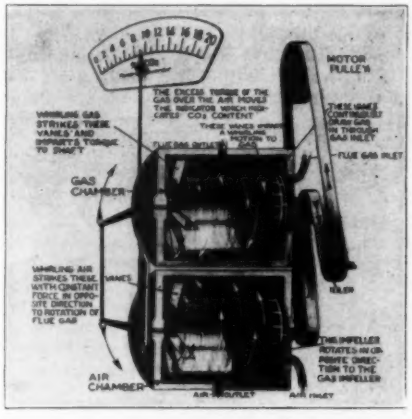


Figure 9

designating the figures on the scale calibrated in terms of CO_2 content of the flue gas. At the same time a clear record of the results is made on a strip of paper by a series of perfor-

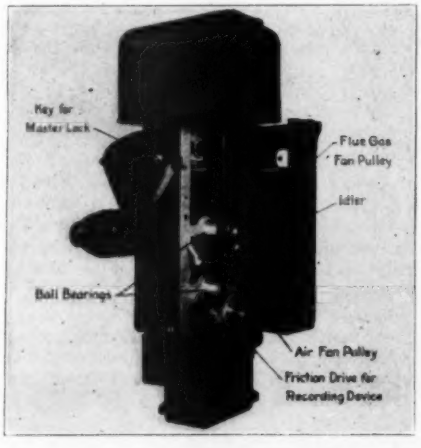


Figure 10

ations, the recording device also being driven by the motor.

The gas is drawn through pipe line at a high rate of flow and since no time is required for chemical reactions or gas diffusion, the reading is instantaneous after the gas enters the instrument, and the total time lag is therefore negligible. With the reading appearing on a large, clearly visible scale and without appreciable time lag, the fireman has a practical guide which enables him to regulate the air supply properly instead of depending upon his interpretation of flue gas conditions that changed several minutes before.

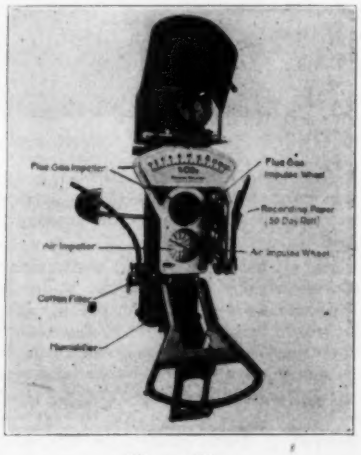


Figure 11

It is apparent that the entire instrument is made up of simple, rugged, mechanical parts; a motor, two impellers, two impulse wheels and a coupling system. A durable, dust-proof aluminum casing encloses the entire machine. The instrument is mounted in the boiler house where it is easily accessible and in full view. The scale and paper record are illuminated by a lamp attached to a swinging bracket.

The gas is drawn from the flue head of the damper and passes first through a porous filter (Fig. 12) where the suspended particles are removed before the gas enters the pipe

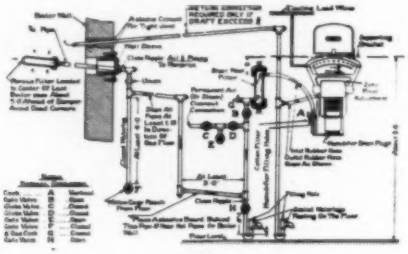


Figure 12

line. The moisture which condenses from the gases upon cooling is collected in the waterlegs. The gas then passes through the steel wool filter and the cotton filter and thence through one compartment of the double humidifier, where it is brought to the same temperature and degree of humidity, as the comparing air which passes through the other humidifier compartment simultaneously. The humidifier is merely a container of water with a gas-tight dividing wall, the gases passing over the water surfaces. After leaving the humidifier the flue gas passes through the flue gas chamber, whence it is exhausted to the atmosphere. The air, in the meantime, is circulated continuously through its humidifier compartment and the air chamber.

The pipe lines from the flue are ½ inch. The passages in the machine itself are also large, and it is therefore evident that there are no small orifices which are readily clogged.

A permanent compressed air connection is provided so that the soot may be blown off the porous filter conveniently at regular intervals.

Fig. 13 shows a large New England boiler house equipped with Ranarex machines. Fig. 14 shows a Ranarex on board

Figure 13

the oil tanker Shenandoah of the Texas Oil Company. The fact that this machine has given satisfactory service for many thousands of miles of ocean travel is proof of its ruggedness and reliability.

Fig. 15 is a section of the Ranarex record obtained immediately after completing the Ranarex installation in a plant. This chart shows that on the first day the CO_2 content could be raised by the help of the Ranarex from 7.8 to 11.5 per cent, resulting in a fuel saving of 8.6 per cent. In this case, as in so many others, the Ranarex paid for itself in a few weeks.

In this connection it might be mentioned that the Ranarex principle lends itself to many other uses wherever the specific gravity of a gas gives some information as to operating conditions. Thus it is possible to determine the density of illuminating gas, the ammonia content in ammonia-air mixtures and the moisture content of air used in drying processes. It is of especial interest to paper manufacturers that a Ranarex SO_2 Indicator and Recorder is being developed at present.

It is apparent that the principle embodied in the Ranarex permits a construction which is both sensitive and rugged.

Figure 14

The component parts of the machine such as a motor, bearings, etc., are well-known and fool-proof, so that any operator can quickly learn how to handle the Ranarex properly. Be-

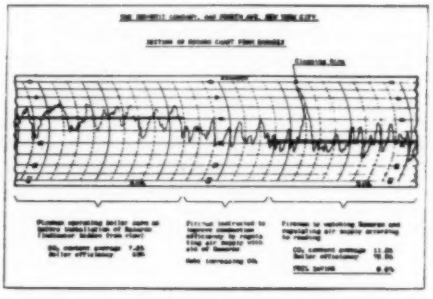


Figure 15

cause of sad experiences in the past with complicated and delicate apparatus, many engineers have felt that it was impossible to design a CO_2 recorder which can be successfully operated under practical conditions. Such men particularly are impressed with the design of the Ranarex and the 700 installations made in this country during the past few years, offer ample proof that this impression is correct and that here at last is a practical CO_2 recorder.

Farrell Foundry & Machine Veterans Celebrate

The annual meeting and banquet of the Veterans' Association of the Farrel Foundry & Machine Co., Ansonia, Conn., was held in Ansonia, May 14, when employees who have been with the Farrel company for 25 years or more were honored.

There are 116 members of the association who have served the company more than 25 years, with the president of the association holding the record for 55 years service, and one other member for 50 years, besides several having 40 years of service to their credit.

Stewart Inso Board Mill About Ready

R. E. Blackburn, who for several years has been connected with the Insulite Co., severed his connections with that company on May 15 and has accepted the position as production manager for the Stewart Inso Board Co., St. Joseph, Mo.

The Stewart Inso Board Co. is just completing a mill at St. Joseph, and will manufacture insolating board under the trade name of Inso Board, from wheat straw. Extensive tests have been carried on for several years by Dr. Sidney D. Wells, formerly with the Forest Products Laboratory, Madison, Wisconsin. The new mill will have a capacity of more than 100,000 square feet per day.

An American Paper Coating Clay

H. T. EDGAR

Miner-Edgar Co., New York City

THE writer has been requested to prepare a paper for this convention based largely on what American clays are accomplishing for coating purposes. On discussing the matter with the authorities at the Bureau of Standards, it was felt that it might be of interest to make this paper a brief historical review of the domestic clay industry from its early beginnings to the present time.

English paper clays are primary (or residual) in character, and are found overlying or in close association with the rocks from which they have been derived, but it is recognized that American paper clays are secondary (or transported) in character, that is, they have been carried some distance away from their point of origin.

During the period 1875-85, three or four progressive clay miners in the South Amboy, New Jersey, clay district, erected clay washing plants to remove the impurities from a fairly white clay occurring in that locality. The product was called "New Jersey washed ball clay" and was largely sold to the potteries, a small portion going to the paper trade.

It is interesting to note that one of these pioneers in American clay washing was Charles S. Edgar, who was the founder of our companies and later applied his genius to the washing of the whiter clays of the South.

During the next few years, clay washing operations were applied to the rather restricted residual deposits of Delaware, Maryland and North Carolina. Most of the product was sold for pottery purposes, the North Carolina plants still constituting an important source of supply for that trade. In 1892, at Edgar, Florida, the Edgar Plastic Kaolin Co. erected a plant which has ever since served the pottery, hotel china, floor and wall tile, and electrical porcelain trades. In none of these plants was the clay produced suitable for paper use.

As far as we have been able to ascertain, the first clays in this country used for filler purposes in a crude state by the paper trade were in the South Carolina territory. One property in this state is said to have operated almost continuously since Civil War days.

In 1909 to 1910, three washing plants were established in the State of Georgia, all of them within a radius of less than thirty miles. The output of each was of necessity very small at the start. Predjudice against American clays in the paper mills was almost universal. Undoubtedly part of this predjudice was justifiable as the preparation of the clay was not as thorough at the beginning as obtained in the preparation of English clay. Furthermore, the physical characteristics of the American clays differed from the English product, requiring variation in treatment in their use.

Very early in the history of the Georgia plants, one of the largest paper mill organizations in the East recognized the value of encouraging American competition and placed considerable business with American producers. At this time, the writer wishes to express his deep appreciation to this concern for their co-operation and encouragement.

Had it not been for such encouragement, when the World War cut off the supply of English clay, American producers would not have been as well equipped to satisfy the tremendous demand. It would be tedious to recount in detail the numerous times these clays received trial orders, only to be turned down. Then the series of crises arose involving the supply of English clay, each of which crises offered an opportunity for American clay to demonstrate its equality.

Emergencies Compel Domestic Progress

Between 1910 and the present day have occurred such emergencies in England as strikes at the clay mines, coal strikes, railroad strikes, dock strikes, boat strikes and finally, and most serious of all, the World War. It may be merely coincidence, but in every one of the operations where a strike occurred, the industry was highly unionized.

As each emergency arose, American paper clays were forced to extend their operations and the paper mills to make a thorough and intensive study of American clays and to adapt their operations to the use of the American clay. It is obvious that to improve such a process or product, it is necessary first to sell it. By the time American paper mills had begun the wide use of American clays, constructive criticisms were offered, and as the producers were reasonably intelligent, conscientious and highly desirous of preparing their clays to meet the most exacting requirements, the result has been that today, American clays are being produced with a lower grit content, lower moisture content and absolutely more uniform than any other clays produced anywhere else in the world.

Take the question of moisture. Reference was made in "Technical Association Papers" of June 1925, Series 8, in a discussion at Coated and Processed Papers Sectional Meeting by Mr. M. L. Griffin as to the method of drying English clays, and he stated at that time that English clay dried unevenly. Their method is known as the "drying pan" system, a term used among American potters. Others designate this system as a "slip kiln." It is generally recognized that where irregular drying occurs in one end of the dryer the clay may be too wet, while at the other end, there is a danger of burning to the point where some loss occurs of water of crystallization, thereby modifying the physical properties, such as plasticity, shrinkage, etc. Also, the thickness of the clay in the slip kiln, (12 to 18 inches) is so great as to make for considerable variation of moisture from top to bottom. In the case of American clays, the accepted practice is to dry the clay in a drying shed by exhaust steam over piping, aided by atmospheric evaporation; filter press cakes being much thinner, making easy, uniform drying. The clay is dried to a point where nearly all the free moisture is driven out. American producers all believe that this makes for a very uniform product. Moisture content, which in English clays runs anywhere from ten to fifteen per cent, is less in the case of American clays, which vary between two and six per cent.

At this time, it might be well to ask the question as to what would have happened to prices of clay during the repeated strikes in England, to an even greater extent in the World War and the disorganized period immediately following the War, if American production had not at least partly kept pace with the demands made on it from the American paper mills.

Tariff Obstacles

American clay producers have not looked for sympathy, but, at the same time, we would like to draw your attention to some of the things with which we have had to contend since 1913. First, we had the Underwood Tariff of 1913, cutting the import duties on English clay from $2.50 per net ton to $1.25. We are convinced that if it had not been for the World War acting as an artificial tariff barrier, American paper clays would have been all but wiped out of existence. During the War period, a large business was established among the news mills along the Canadian border and in certain parts of Canada, among the book mills of New England and along the Atlantic Seaboard. Due to the manner in which McAdoo administered the railroads of the country while they were under Government control, freight rates were increased to such a point that all of the news business was lost, due to the fact that freight rates were in most cases higher than the price of the clay. Practically all of the New England business was lost and a large part of the business of the Atlantic Seaboard.

With the return of the Republican party to power, a new tariff bill was put through, but, due to a combination of lack of initiative, carelessness and over-confidence, clay producers succeeded in having the rate on English import clay restored only to the rate prevailing before 1913, namely, $2.50 per net ton. Meanwhile, the value of the dollar had dropped to between fifty and sixty cents. With rare patience and tenacity, the American clay producer went to work again and built up practically a new business in the Central West and Wisconsin and Minnesota fields.

Since the War, various efforts have been made by the English to recover the markets lost to them during these years. It may or may not be true that an effort was made to buy up the American producers and that when the size of

[1]Presented at the eighth annual meeting of the American Pulp and Paper Mill Superintendents' Association, held at Richmond, Va., May 26, 27 and 28, 1927.

the investment was learned, the effort was given up. On the other hand, there is no doubt that, in a more legitimate way, the English have attempted to recover some of this lost ground through efforts to secure freight reductions and to enter the Central West by means of boat deliveries to points on the Great Lakes in Michigan and Wisconsin. The freight rate reduction is based on the brick rate and the Interstate Commerce Commission stated that this reduction should apply to Domestic clays, but so far we have been only partially successful in securing these rates, while they have been granted to the English with very little effort.

Since the War, a cartel was formed in England for the control of prices, the direct effect being to sell filler clays comparable to the American product at an extremely low price, the apparent effect of which would be to recover their own business or destroy American competition, as one might choose to view the matter, and, at the same time, to maintain very strictly, prices on high grade filler clays and coating clays on which there had been no American competition. These facts and efforts can be confirmed readily by referring to the "Chemical Age," an English publication, with particular reference to the publication of November 21, 1925. The headings in a very complete article were as follows: "Nine Months Trade," "Pre-war Record Nearly Reached," "Good Prospects in U. S.," "Common Clay Production," "Fixing Prices," etc.

A Coating Clay by New Process

It was at this point, when efforts were apparently at their height to harass the American producer of paper filler clay, that a proposition came before Edgar Brothers Co. to take their Georgia clay, and through a chemical and bleaching treatment, improve it to a point where it would serve American paper mills for coating purposes and also act as a high grade filler.

Although this process was a patented one and the plant was in full operation from the latter part of 1925, it was not until late summer of 1926 that the process had been improved sufficiently so that the clay had reached not only the desired standard for color and uniformity, but that it could be produced in a commercial way so that it could be sold at a price to compete with English clays of a similar color standard. That the results have been obtained is readily shown by the fact that leading paper mills not only tested out the clay thoroughly in their laboratories, making most rigid comparison with the English product, but followed this by successive mill runs, and in a number of cases put the coated paper through a number of rigid tests, followed by time tests on the paper, and the obtaining of the opinion of the trade using the paper, after which time a number of large representative mills entered into contract on this clay. At the start, it was necessary to proceed cautiously until we had satisfied not only ourselves but had obtained the verdict of the paper mill user, and so one of our washing plants was adapted to the production of this particular clay. When the verdict was known, it was decided to erect a plant specially designed for this purpose, built in units which could be added to promptly as the demand developed. This plant is now completed and ready to operate.

It is necessary for the writer to refer to our own organization because we are (as far as we know), the only corporation producing an American coating clay and, therefore, we hope we will be pardoned for such references.

Expressions from Authorities

The writer, and none of his associates, pretend to be paper experts, so we have secured the opinion of some leading authorities on our clay and will take the liberty at this time of quoting what has been said about this product by some of our good friends. In each case, we feel bound to conceal the names of those involved. One of the large users of our "H. T." coating clay reports as follows:

"1—It must have a bright color, free from tinting. A good bright natural is generally preferable to a blue white.
2—The clay must run absolutely uniform with respect to color and quality.
3—It must be free from dirt and sharp grit.
4—It must make a free flowing paint when mixed in proportions of 100 parts of dry clay to 140 parts of water, and the equivalent of 15 parts of dry casein, properly cut with alkali.
5—The clay must be sufficiently colloidal to make a color which will spread well on the paper and given an even, smooth, high, finish to the sheet after the latter has been calendered.
6—It must be free from water soluble chemicals which might cause deterioration of the raw stock or coating material.
7—It must be available, in quantity, at a price which the trade can afford to pay.
I will say that your clay meets enough of these requirements to make it mighty interesting to paper coaters."

It has been asserted by a mining engineer who has devoted the last few years exclusively to an intensive study of American clays for high grade paper use, both in filler and coating paper, working in one of the very best paper mills in the United States, that as a result of intensive study and experiment, it has been proved by machine runs "that as high as 25 per cent additional clay may be added to paper stock when the clay is of uniform consistency and the sheet has greater opacity, takes a better finish and the finished sheet carries all the tests and requisites that is intended of it.

"In coating paper, the same applies only more forcibly, for with a very fine uniform base, particles will lie closer and more solidly on the surface of the sheet being coated, will have less light refraction, have greater opacity and will give a higher and better finish after calendering."

Excellent Qualities

In the ordinary washing of domestic clays, it is recognized that the clay should flow with just enough speed to keep the clay in suspension and to drop out foreign matter, to employ a very high volume of water to have the clay flow at such speed that every bit of grit and foreign matter will drop into the troughs, up to a point where anything of higher specific gravity than the clay has been extracted. In the preparation of our coating clay, we start from this point and by a chemical treatment take out practically in its entirety, all other grit and foreign matter and even some of the coarser particles of the clay, which are not as old geologically as the rest of the clay, and are also darker in color, and the resulting product is of an exceedingly great fineness and uniformity, approaching a colloidal clay.

At this point, actual experience shows two results which ordinarily would be contradictory in character. In the first place, it should be expected that a clay as fine as this should give a very high finish. As a matter of fact, actual mills using the clay state that a higher finish is obtained than in the use of English clay. It is our understanding that "satin white" is used for two purposes, to bring up color and to obtain a high finish. Because of the fact that this clay gives a high finish less "satin white" is needed, and as "satin white" is so much higher priced than clay, an economy is effected in this respect.

On the other hand, one of the great authorities in the United States has just completed for us a test of four of our American clays and has also tested a number of representative English clays, and one of the conclusions he draws is that our coating clay requires somewhat less casein than did the average of the English clays tested. I am told that ordinarily, where the particles of clay are very fine, more casein would be required. That the reverse is true in this case is curious, interesting, and again from an economy standpoint, of great interest to the paper mill user.

Recapitulation

Color.—Leading authorities among actual users of this clay, both for high grade filler and coating work, as well as chemists who are considered authorities in the paper mill trade, state that this clay matches the very best English clay for filler work as to color, and beats or equals the lower and medium grade coating clays among the English for coating work, but is exceeded in color by a few of the very choicest and highest priced English coating clays.

Grit.—We believe we have demonstrated that we have good reasons for stating that the grit in this clay is reduced to a

point never before approached by a clay, domestic or foreign, because after removing all the foreign material possible by mechanical washing, we have removed practically all the remainder through chemical treatment. In a large mill the economics that should result from this treatment should be appreciable and we would welcome a report from some of our friends as to the actual saving on their wires during the course of a year. We believe it would be found to be very considerable.

Uniformity.—We feel we have proven reasons for believing the clay developed by this process should be more uniform than any other clay yet produced.

Moisture.—We have demonstrated that by the very methods used among all the leading washers of clay in the Southern field, the moisture content, following American practice, is very considerably lower than obtained by methods used among English producers, and that a fair average of moisture in clays produced in the Georgia field would be a variation between two and six per cent.

Casein Required.—We have quoted an authority who would be respected by anyone in this room regarding tests made on half a dozen English coating clays, striking an average and then making similar tests with casein on our "H. T." coating clay. The result was that in spite of the fineness of particle in our product, actually somewhat less casein was required to coat a sheet of paper. Quoting further from the same authority—"The value of this casein test to the paper coater is obvious, for casein is a relatively expensive material and it is undesirable to use more of it than is necessary. Also increasing the amount of casein reduces the gloss which the paper will take on calendering and retards the penetration of the printing ink, which is a factor in rapidity and expense of printing."

Satin White and Other High Priced Coating Materials.—We understand that many coating mills use "satin white" or some other high priced coating material in connection with the clay for two purposes, to get a higher finish and to bring up the color of the sheet. We have been assured by users of our clay that due to the fact that the individual particles of the clay as produced by us are so very fine and uniform, a higher finish is obtained than by the use of any other clay, domestic or foreign, with the result that less "satin white" is required, where one of the objects to be obtained is high finish.

Quality.—We are sketching herewith briefly why American clays have had a logical development from the crude state up to the product we are discussing at this meeting. In the order of development of the clay business in this country, and in a perfectly logical growth, we have:—

1—A crude clay which, because of irregularity of the product as it occurs in nature, is limited in its application for high grade use.

2—A clay mechanically washed which we have traced through from its early somewhat unsatisfactory period to the highly developed product which is now prepared by ourselves and our respective competitors for filler use among the paper mills.

3—A process combining the best of the mechanical washing followed by a chemical and bleaching treatment. The resultant product is found to be practically free of grit and other impurities of the same specific gravity, together with a portion of the clay itself which is found to be coarser in nature and of a darker color than the remaining clay. The final result is a clay which is more uniform in character and of the finest of individual particles, characteristics much to be desired in coating work. It is reasonable to claim that a greater control of the uniformity of a clay, both as to color and as to character, can be secured by the use of chemicals, which can be measured with exactness, than to a vast extent would be possible to find in a crude clay, and, to a less but considerable extent, in a clay mechanically washed.

Service.—We have enlarged somewhat on the difficulties of getting English clay over to this country by recalling to your attention, the variety of strikes that have occurred over there and the World War, causing clay to move to this country less freely. Nothing has been said previously about the irregularity of service, due to storms in the winter and bad weather, sometimes even to the extent of vessels going down, and in a broad way, it is considered undesirable to draw material from a great distance if a product of a satisfactory nature can be obtained nearby. We believe that, in at least some respects, the World War was not all a loss and that among other things, manufacturers of all sorts have had their patriotism more fully aroused, and that the paper mills are no less patriotic than other lines of business, and we feel sure that if they can get a product in their own country that is of equal quality to a foreign product and at a satisfactory price, that they would prefer to place their business in the United States.

In connection with this, it is not necessary to enlarge further on the fact that with English clay, it is either a "feast or a famine," with demurrage charges and other things involved, whereas domestic clay can be taken in exactly as wanted and deliveries to almost any point in the United States where paper mills are to be found made in not much over ten days as an extreme limit.

In addition to this, as an organization, we have always featured our storage capacity, and with the completion of our new plant, we will be in a position to carry up to 20,000 tons of clay in a condition ready to ship at any time, and with the irregularity of the demand among paper mills, the variation of their requirements in paper, some of which load very heavily with clay at times and at other times lighter, it is a great comfort to know that no matter what the demands may be, or how sudden, they can be taken care of immediately.

Besides all this, among all the Southern producers, the mines are run on non-union labor and never yet, as far as we can recall, has a strike developed. The Negro is strongly individualistic and does not lend himself to being organized.

Quantity.—It is a natural question to ask as to whether the American mines are liable to be exhausted at a reasonably early period should the paper manufacturers switch from an English source of clay to a domestic product. We are willing to grant that the English mines are, in their entirety, almost inexhaustible. However, we can state conservatively that we have reserve supply, working our plants in an even much larger way than we are doing today, to cover all requirements for many years to come.

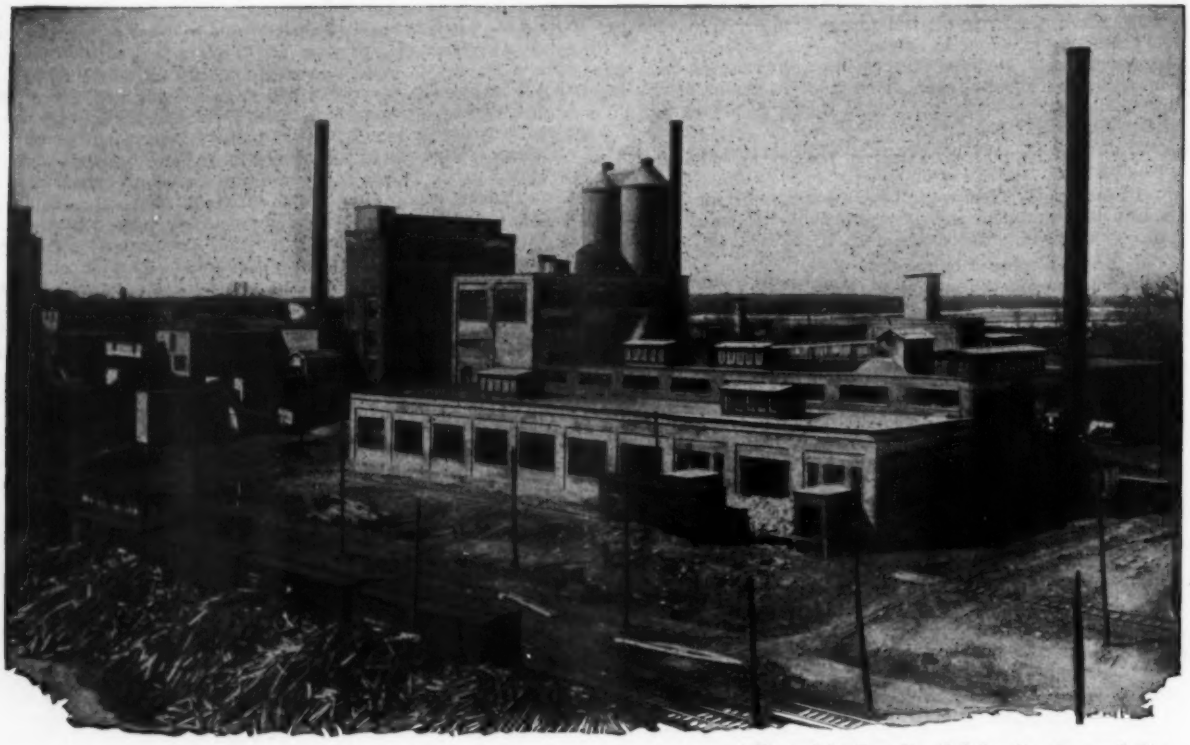
As a final conclusion, we would like to recall the fact that we could have accomplished the results we, and our leading competitors among washing plants in the South, have in the way of a very perfectly mechanically washed clay for filler use only because we have been loyally supported by the paper mill manufacturers of the United States. Their criticisms have been of a kindly and constructive nature and have been exceedingly helpful to us in learning where we might improve our product and we believe the results speak for themselves.

It is not logical to believe that if we get the same support for this high grade filler and coating clay, that we can thereby become a stabilizing influence on prices, act as a regular source of supply, as well as an emergency source of supply? There are those among you who know that we are willing to extend our facilities to whatever extent the demand requires. We neither make the claim nor do we believe we have reached the Nth degree in the development of our processes, but we do want your loyal support in our endeavors to that end.

At this point, we wish to acknowledge our debt to one of the great paper mills of the Middle West who stood with us in our early experiments in the development of our coating clay processes, and who, in consequence, made it possible to find out wherein our product was wrong and helped us to bring the clay up to its present standard.

Practically all users of clay know that the American product does not act the same as does the English, and in attempting to use this clay for coating work, difficulties will have to be overcome. This is easily accomplished by more violent agitation and possibly by deflocculating the clay to a moderate extent by the use of sodium silicate. We believe that the study and effort involved will be justified by the savings obtained, as well as by the benefit of prompt service and the satisfaction of giving business to an American producer and having the money stay in this country.

I would like to acknowledge with thanks the help received from the several chemists in paper mills for their assistance of whatever nature, together with the samples of paper containing our clay so kindly furnished.



Plant of the Canadian Cellulose Co., Cornwall, Ont.

Equipped for *continuous* causticizing

The new plant of the Canadian Cellulose Co., which recently went into operation, represents the latest practice in Soda Pulp Mill design. The successful results that are being obtained speak for the soundness of the engineering principles underlying the methods and equipment which were adopted.

It is significant to note that Dorr Equipment is installed for carrying on continuously the recausticizing operation.

Agitators
Thickeners
Classifiers
Pumps
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The Dorr Continuous Causticizing system is applicable to both Soda and Sulphate Mills. Our Engineers will be glad to discuss with you the economies that can be realized by installing Dorr Equipment in your Mill.

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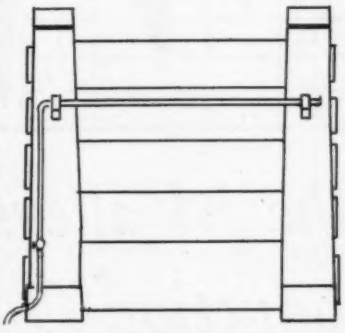
Practical Helps for the Mill Man

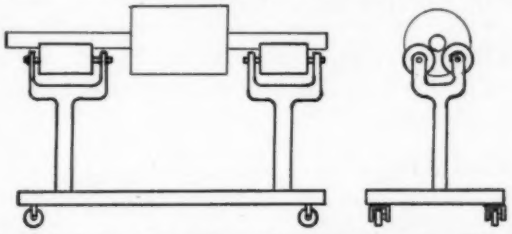
To Get a Better Finish on Fine Papers

SECURING a better finish on fine papers is a matter which interests every operating superintendent in such mills. One mill is getting this result by the use of a steam shower on the calenders. When it is desired to buck up the finish, the steam is turned on and the device gets results. The whole thing is very simple, consisting merely of a shower pipe supported by the calender frames. This is connected to one of the steam supply lines and all the backtender has to do is to turn it on.



A Motor Repair Stand

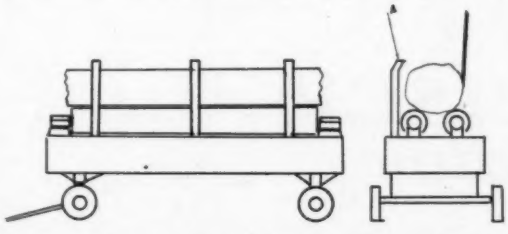
EVERY paper mill does some of its own electrical repair work and much of this is on spare motors. The chief electrician in one mill has worked out the device shown to permit of free access to all parts of the rotor of a motor



when it is being rewound or other repairs made. The stand is rather heavy in order to keep it from upsetting. The base is mounted on casters. From the base rise the two posts and at the top of each is the set of rollers shown. The stand is rolled under a chain hoist and the rotor placed so that the shaft is supported by the two posts. Then the rotor may be turned freely on the rollers and the whole stand may be rolled to any part of the shop in order to reach a bench or some stationary tool.

Handling Dryer Felts

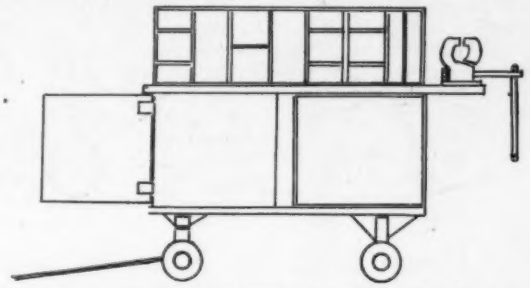
HANDLING dryer felts on the new, wide, fast-speed machines is becoming something of a problem. This refers to the handling of rolled felts when running them onto the machines. The accompanying sketch shows a truck



which has been used successfully in a paper mill having heavy felts to handle. The truck carries two heavy rolls—the original one utilized two spare dryer felt rolls, as this use caused no deterioration. On one side of the truck, three substantial posts such as (A) are fastened. In mills where the machines are all the same size, the next dryer felt to be used may be kept on the truck. In other mills the felts can be kept on a rack from which they can easily be rolled onto the truck. The felt is so placed on the truck that when the felt is being run onto the machine the lead from the roll of felt is away from the posts on the truck. In this way any tendency of the felt to roll off onto the floor will be counteracted. After the end of the new felt is sewn onto the cut end of the old felt, the running of the machine will turn the roll of dryer felt over on the rolls of the truck and much difficult work will be eliminated.

A Millwright's Supply Truck

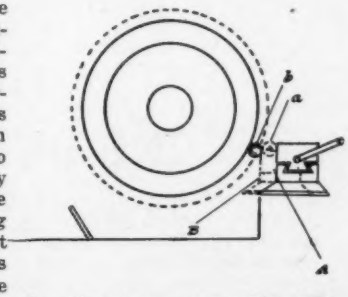
MUCH millwright time is lost in paper mills by the millwright going to the supply store for a bolt, a nut, a piece of packing or some other supply. Frequently the millwright on the job needs a vise, and he marches a couple of hundred feet to a bench, or else he goes all the way to the

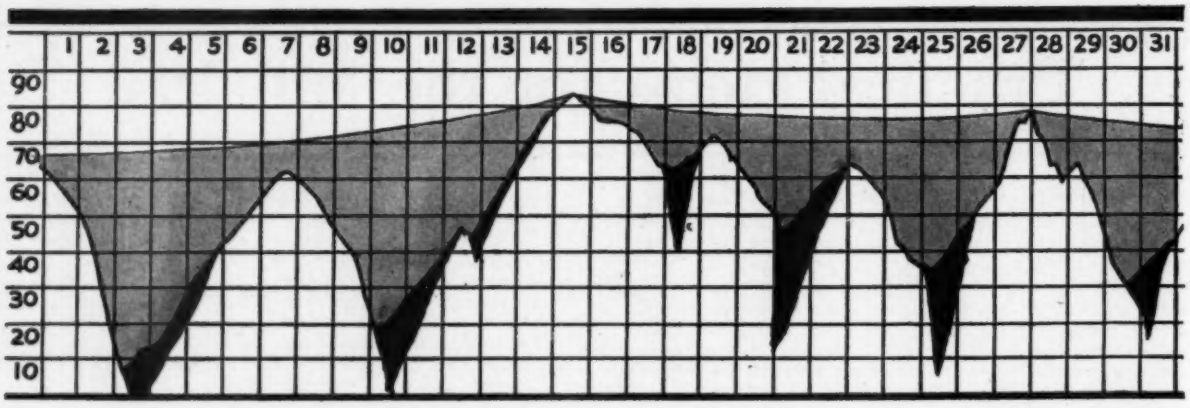


shop. The accompanying sketch diagrams roughly a truck which was used by the millwright department of a large paper mill. In the various bins were placed a supply of the usual sizes of bolts, nuts, washers, packings and so on. There was a narrow bench along one side and on this was a crane. The compartments underneath were used for larger tools that the character of the day's work planned gave the millwright reason to believe he would use: jacks, pipe wrenches, and so on. These cupboards could be locked to prevent the irresponsible from taking the tools away and letting them lie. This arrangement saved each machine or department millwright untold minutes on Sunday and the work of gangs on week-days on special jobs could also be speeded up in this way.

Pulpstone Sharpening Device

A GROUNDWOOD superintendent recently pointed out that one reason the pattern on the pulpstone was often faulty was the design of the sharpening device. The sketch shows a pulpstone with the sharpening device. At (a) is the position of the burr when the stone is big. At that time the burr is well supported and controlled by the stand (A). (b) indicates the position of the burr when the stone gets smaller. In the present design of most grinders, the burr is put in this position by shoving forward the rod on which it is carried. There is then an opportunity for the burr to play as it is supported only by the rod and very little by the whole sharpening device. This superintendent believes, and practices his theory, that the whole stand should be shoved ahead as the stone gets smaller. This is shown in position (B) of the stand. This gives the burr at all times the solid support of the sharpening stand and improves the pattern which the burr puts on the stone.





Eliminate the "Valleys" in Production Quality

OFTEN a chart of paper production—from a quality standpoint—would disclose unprofitable dips or "valleys."

In many cases this descent from high standards of production may be traced to the size and the manner in which sizing operations are conducted.

The use of Kalbfleisch Rosin Size and System may be depended upon to maintain sizing results at a profitable level. Kalbfleisch Rosin Size has established an enviable reputation for cleanliness and uniformity; and the helpfulness of the De Cew Sizing System, installed and supervised by Kalbfleisch engineers, likewise is established.

We sincerely believe that it is to your advantage to investigate the possibilities of Kalbfleisch Chemicals and Service for your production.

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Safety as a Production Factor in Paper Making[1]

BY W. J. PEACOCK

Chairman of Paper and Pulp Section, National Safety Council

THE subject embodies the conviction that organized safety has a relation to dividends. Such, indeed, has been the experience of leading mills, and eminent safety men like Lundrigan, of International, Hoyman, of Kimberly-Clark, Phillips of Champion, Franz Rosebush, of Nekoosa-Edwards, Gleason, of Hammermill, and Ashe of Thilmany have given their testimony as to the place of organized safety in the efficient plant. However, I want to express an opinion in which these experts will concur, that it is best to approach safety as a sign of an efficient plant rather than to require proof that it is a cause of production. Safety, like the public school or the neighborhood church evidences the judgment of men who realize the ultimate purpose of society to enrich life. The unsafe plant, not the safe plant, must declare itself. They are thinking at cross purposes who demand that safety justify itself as a money-maker.

I recall a statement of a practical machine tender less than ten years ago which may have illustrated a common state of mind then, but is certainly out of date now. He held up his own right hand, pitiful evidence of a kind, and said, "Here's the high-sign of papermaking: two fingers missing." My opinion of that sort of expectation, might be expressed by the slogan of Rastus: "Dat ain't no sign."

Mose had returned the day following the purchase of a mule complaining that the mule was blind.

"Wherefo' you say dat mule am blin'?" demanded the former owner.

"De surest kind ob sign," asserted the indignant Mose. "Ah naturally led dat mule home yestiddy,"————

"Yeh, strange mules should be treated with respect."

"An' dis mawnin' I led him out to pasture,"—

"I'se a lis'nin'."

"Well, dat mule rared his heels a couple of times, den ran square head fo'most into a tree."

"Huh, Niggah. Dat's no sign a mule am blin'. He des' don't give a dam!"

As between those who "don't give a dam" about accidents and those who demand proof that safety pays, there is, of course, a great deal of choice, but certainly the pulp and paper industry of 1927 resents any "high-sign" of maimed members.

Some Telling Mill Practice

Take a little evidence. Laurentide Mill, with over a thousand employees, has a remarkable minimum for the past three years of only 18 accidents per million hours worked. International Paper Company cut their accident totals two-thirds in ten years. Their Otis mill, with 916 men, sustained only 12 lost-time accidents in 1926. The big Kimberly Mill, Kimberly, Wisconsin, achieved a low mark of 7 accidents in 1924, with 950 men on the payroll. Nekoosa-Edwards, cup winners in 1925, came back in 1926 with the breathless record of 7.86 for accident frequency, and .17 for severity, 864 employees putting the thing across.

Some idea of what these figures represent will be gained by a comparison with the achievement by the rest of the industry. In 1920, some forty mills reporting averaged in frequency 46.34 accidents per million hours worked, and a severity rate of 2.60 days lost for every thousand hours worked. In 1926, thanks to increasing interest, 133 mills sent in their statistics, showing a decrease of 22 per cent in accident frequency, (36.77) and a drop of 25 per cent in severity (1.95). The paper and pulp industry does give a tremendous dam about accidents. If there were no other incentives, forward-looking mills would be impressed by the example of 119 mills engaged in a six-months' safety contest. Large mills, medium-sized mills and small mills, some led by safety engineers, most of them by volunteer safety committees, think enough of safety to engage in a friendly scrap of national dimensions, enduring publicity and the clinical scrutiny of The National Safety Council.

[1]Presented at the eighth annual convention of American Paper and Pulp Mills Superintendents' Association held at Richmond, Va., May 26-27-28, 1927.

Curiously, these 119 mills are not asking me to prove that safety pays dividends, nor are the score of mills, belated for the 1927 Cup Contest, who have registered on the ground floor demanding a return contest in 1928. What is there about safety of such commanding importance as to make mills noted for their efficiency, extend themselves to be known also as Safe? For that matter, what is there about safety in its public aspects that leads historic Richmond, our convention host, to announce as its slogan "Make Richmond the Safest City of the South?" The answer to these larger problems contains the information you have asked me to contribute under the topic, Safety as a Production Factor in Paper Making.

Public Demands Safety

Our entire country is coming into an appreciation of human life as the consideration of transcending value. Business has no justification apart from its ministry to human comfort. Public conscience now goes after any institution that thinks it must have its pound of flesh as part of any bargain. The State comes to industry with laws regulating working conditions, sanitation, wages, hours, guarding, inspections, and follows up every serious accident by telegraph. And this interest of the State simply represents a public opinion which we all unwittingly help to mould. The same public opinion that turned against slavery, that had its doubts about the corner saloon, now demands protection for the hands that must earn the American living, and curiously enough, that public opinion expects Industry to find the way to a solution for all these problems. Like the father of a growing and care-free progeny, Industry may resent the "overhead" added to our burden, but it is part of what society in ever-increasing measure demands of Capital. Industry is the big "papa" of young America, and efficiency is now spelled s-e-r-v-i-c-e. Safety is just one phase of a job, God only knows how big, that Industry is asked to supply because Industry seems to be our nation's chief dependence. And the National Safety Council, organized and supported in the main by the plants of the country, reflects the seriousness with which Industry has accepted these overhead demands of the public.

Also from within our own business enterprises comes increasing emphasis upon human values. A convention of superintendents, in itself emphasizes the fact that Industry is dependent primarily, not upon machinery, nor indeed upon raw material, but upon brains. Industry pays for human service every four years sums that would buy the average plant and its equipment.

From the cost department comes additional emphasis. Accidents to human beings are discovered to be not fixed losses, like depreciation, replacements and reconstruction items, but variable losses. For instance, five mills in one vicinity are discovered, under a new rating by experience, to have woodroom insurance costs varying from $2.28 to $5.69 per hundred dollars of payroll. Two mills, competitors in the same field, find the law apportioning a credit of 6 per cent to one while demanding from the other an increase of 36 per cent. The cost department sets up the howl that such a difference means 62 cents a production ton, and there are sundry sessions on the carpet before the Cost of Accidents has been emphasized to the satisfaction of the general manager.

To the paper industry, as a whole, at a time when cost of production spells life or death, comes the announcement that due to accidents, heretofore running largely to infections, our pulpwood costs are burdened with 30 cents a cord. In the State of New York, in 1926, compensation for 1965 paper mill accidents amounted to $626,164, an amount in doles of two-thirds the injured employees' regular pay which gives scant comfort at best.

Let it enter the minds of executives that four-fifths of all accidents are preventable, and the inquiry takes root as to just how much of that two-thirds of a million dollars might reasonably have been turned into dividends. During 1927, the American Engineering Council is gathering statistics as to the effect of accidents upon production and production costs. For years authorities have been educating industrial executives that "every preventable accident is a human misfortune, an economic loss and a discredit to somebody." Meanwhile comes the depressing assurance that compensation charges are constantly mounting. In Wisconsin, the loss

Excerpts from letters in our files. Names on request.

actual service that proves

Naturally, the efficient performance of Noble & Wood engines is of importance to this company. Therefore, when a refill job is necessary, it is only good business to use Noble & Wood fillings.

These fillings are the best we know how to make. Before offering new steel or bronze to the paper industry, fillings are made and tested in actual service. We *know* how these bars will act under varying conditions, that they will withstand the wear and tear of beater and jordan. Chemical and physical analysis isn't enough. It's the hammering of roll and plug that tells.

The wood, too, is carefully selected. Only clear maple or white oak is furnished. Free from knots—thoroughly seasoned.

When in need of beater or jordan fillings, get in touch with us. We carry an ample stock on hand—steel, bronze and wood. Urgent orders can be shipped within 24 hours of receipt. And before shipment is made, every bar, wood, steel, or bronze is carefully inspected.

The NOBLE & WOOD MACHINE CO.

Hoosick Falls, N. Y.

of an arm formerly cost industry $3120; now a final settlement may call for $9000. A hand compensated for in 1918 by $2340 now costs industry $5460; an eye $1365, now $3300. The maximum weekly compensation in 1918 was $9.75; now it is $18.20.

"And you tell me that 80 per cent of all accidents are preventable?" repeats the general manager, who then demands first of all the elimination of that 80 per cent of accident-cost which spells waste. Let the general manager next discover what H. W. Heinrich, of The Travelers Insurance Company, is telling the world, namely that a study of 5,500 cases establishes the fact that the **incidental** cost of accidents, which is paid directly by the company over and above the cost represented by compensation, liability claims and medical treatment, is four times the burden carried by the insurance company, and your paper mill is ready for a safety program that goes the length of efficiency.

Paradoxes

By this time, if you have followed my argument, you will agree that Safety efforts in industry need not justify themselves as immediate agents in production or as directly responsible for dividends, and you will be willing, with the writer, to assist the American Engineering Council to get at the facts and to await their findings. As concerned with our subject, may I suggest some paradoxes demonstrated by safety experience?

1—Guards prevent only one-fifth of plant accidents, but that one-fifth represents 60 per cent of our compensation charges. So by all means let's **guard** our mills. The **incidental gain** looms large. Freedom from hazards promotes interest in the job at hand. Incidentally, every guard you install, allowing for depreciation, will pay a satisfactory dividend in insurance credits.

2—Carefulness, the habit which Safety creates "nothing else but," instilled by contests six months long, is a gold mine in the increased efficiency which employees bring to grading wood, economy of sulphur and stone, working up screenings, keeping pulp clean, preventing waste in steam, oil, repair parts and tools, not to mention keeping the mill clean, team work, loyalty to the firm, and everyday honesty. Carefulness, the fruit of safety organization, becomes gratuitous seed planted for quality, production and economy. In fact, Vice-chairman Hoyman was talking sober truth when he declared that if production were demanded of him, he would first of all start a safety contest! "After licking a year's accidents, your men will beg for something hard!"

3—A third paradox uncovered by experience is that fear is bad psychology. Humor is better, but the fighting spirit is essential. In the No-Accident Contest of The Paper Industry, of the 119 contesting mills entered in January, February and March of the present year, not fewer than three dozen mills per month have gained that happy credit—at least one month entirely free of accident. I am reminded of Jim Robinson's story of the annual county fair in Ireland. On the closing day, all cares are forgotten and those present drink up and engage in a free-for-all fight. On such an occasion, declares Jim, one happy scrapper struck another on the head with a rock and killed him. At the inquest it was discovered that the deceased had a very thin skull, but that did not deter the jury from their duty of finding the prisoner guilty. "Have you anything to say before sintence is pronounced?" demanded the judge. The Prisoner stood up and said: "Far be it, Yer Hanner, from me to deny that I must have thrown the rock. After all the tistamony, I wouldn't make the attimpt. But as one Irishman to another, I ask you, 'What right has anny lad with a thin skull at a county fair?'" The safety game is no undertaking for thin skulls. It will put rare fight into your men.

Fallacies

Perhaps you will listen further while I mention also a few fallacies which safety experience has shown up.

1—The fallacy that we have no particular concern with what a man is or does away from the mill. Read Boyd Fisher's "Mental Causes of Accidents" and discover how many accidents come from a state of mind. Your employees don't park their home worries in the gate house, nor hang up their fears of sickness or their anxiety about debts with their coats. A worried man is often the cause of accident.

Furthermore, when we hire a man, we put the whole man on the payroll. Is he blind in one eye? Has he poor teeth, diseased tonsils, chronic rheumatism or specific disease? If he gets hurt you will find that you have hired the whole man, booze-fighter, night-owl or moron. I could tell you an interesting story of an employee, a month on the payroll, hired for a temporary job, who sustained a broken leg. Instead of being through with his services, as the foreman thought, in six weeks, it was sixteen months later when the man was discharged by the State Commission, his cure having cost over two thousand dollars and his compensation $1018. Consider the man who was accustomed to occasional sprees. We were foolish to wink at his drinking because he was a superior workman. An even hundred days of lost time was the loss sustained. Safety makes you and your men keen about these matters, and your best temperance work will come from friendly fellows, proud of the plant and sympathetic to the families of their mates.

2—A second fallacy, hinted at already, is worth attention: "Leave accident cases to the insurance company, that's what they are paid for." If you only could! But you have lost-production to think of—the time out when men stop working to look on and talk, or to get a firmer grip upon their nerves. There is the time of foremen and superintendents to consider, breakage to machinery, spoilage of material, the cost of filling the injured man's job with new help, the cost in loss of profit in the injured man's productivity or due to idle machinery. Accidents shoot holes in plant routine. You can't leave matters to insurance companies.

3—The most interesting fallacy comes from confusing the "accident" with the incidental injury a man sustains. To illustrate. In a boiler room, a certain expansion plate had worked loose. Whether it was the throb of pressure in the header pipe, a misplacement due to construction activities on the new coal conveyor, or oversight by men who covered pipes in the vicinity, each may hazard his own guess. The point is that "the accident" was all set waiting for some vibration or disturbance. That plate, undiscovered by the crew, passed up by the safety inspector, is due to fall. In falling, it may miss human beings and content itself with noise. It may strike the castings and lose some of its force. It may fall on the foot of the fireman. It may "get" a boiler washer in the shoulder. The chief engineer may be the victim, or the general manager himself. The fact that a fine, quiet-spoken ash-wheeler sustained a broken head was only the brutal incident. The "accident" had been up yonder all the time, preventable all the while. Curiously enough, it is only when a man is injured that we feel the force of accidents. Even then we may underestimate "accidents" which occur without injuring men, but always cause interruptions, always add to our costs, and all the while call attention to poor housekeeping, wasteful methods, carelessness in many forms, important clues to our losses.

Safety With Results

I realize that my entire discussion, while having indirect relation to the inquiry in your minds, has evaded the issue. That has been done with "malice aforethought." From the standpoint of accuracy, we may well await the findings of the Engineering Council. Meanwhile what has been said ought to start individual inquiry in many minds. However, the testimony of a veteran like John Lundrigan, that safety work in the International Paper Company is, and has been, for years on a dividend-paying basis, should be taken to heart. DeBlois, in his book, "Industrial Safety Organization," quotes the figures of insurance costs at Kimberly-Clark mills, less than half of average premiums. Hammermill, American Writing, Mead and a host of smaller plants all frankly urge the savings in money and the vastly increased efficiency due to safe conditions. In Wisconsin, thanks to organized safety in the paper industry, despite an increase in maximum weekly compensation from $9.75 in 1918 to $18.20 in 1926, the major premium on paper making is actually two cents less than it was formerly.

But all these considerations seem beside the question. Safety is like a package of seeds which you can buy for a dime, full of potential energy. Forget the demand that

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Imagine a driven pulley on the moon and its driver pulley on the earth, both connected with a leather belt.

The belt pull and bearing friction, of course, would be enormous. Such a drive would be impossible owing to the weight of the belt.

But if there were such a thing as a weightless belt, the bearing reactions due to that weight would be zero.

Very few belt users ever think of the advantages of a belt light in weight.

VIM Leather Belting is considerably lighter than Oak-tanned leather belting. VIM weighs only .0301 lb. per cu. in. while oak weighs .0355 lb. per cu. in. Oak is 18 per cent heavier.

The table below shows the difference in bearing reaction due to this difference in weight for a belt 30 feet between shaft centers, for a belt 1 sq. in. in section. The sag of the slack side has been varied all the way from ½ in. to 4 feet.

Sag Inches	Tension due to weight of belt. Oak	VIM
½	1150	972
1	575	486
2	288	243
3	193	162
4	144	122
6	97	81
12	49	41
24	25	21
36	17	14
48	14	12

This is only **one** of the advantages of VIM Leather Belting. In addition VIM has the highest coefficient of friction of any belt.

It withstands higher temperature. Is waterproof. Does not require belt dressing. Is stronger, tougher, and more pliable. Is the most elastic belt. And it is the most durable.

Naturally, the cost of VIM is greater than that of any other belt but it is worth several times more.

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safety pay direct dividends. Think of it as seed germ which you are to plant in your organization, or, to change the figure, inject it as a lubricant into the human engine that runs your plant. It will assure you production without friction.

Let safety express your honest concern for the well being of your men. Let them know that to your mind, a human finger represents a part of human personality and cannot be covered by money compensation—that an eye means to the boss what a window is to a man's soul. Don't be afraid to let men feel your dead earnest purpose to protect them and their families through them. Refuse all chance-taking, even though it be from mistaken loyalty to your own self. Be the one around the place who realizes that business functions best as service to life. By your attention to safety, exalt papermaking as distinguished service not only to your customers but to those who make the sheet. Safety, likewise, has its place in plant discipline. As between the austere front with which one superintendent masks himself for fear of being taken advantage of, and the convivial spirit of another which shares hip-flasks with the crowd, the safety principle gives a man a chance to be boss, leader and comrade in one. It is the growing experience of some 3000 firms in the National Safety Council that a valuable approach to the measures employers would like to attempt for their men, is found in the safety game. Here is a point of contact where the interests of employer and employed merge in utter good will.

Safety is the key to that human factor which alone guarantees production. Without mawkishness a man can be a decent Christian and put it across. Safety gives a fellow punch for "the second mile" and answers the secret yearnings of your men to know the man they believe you to be. Let's forget "dividends" and think of factors. A greater than you or I is authority for the principle that wholehearted service for "a kingdom" that includes a man's God and a man's brothers invites the rarest kind of "added" things. You can translate them into dividends of cash eventually.

Fox River Valley Safety Conference

Elaborate plans have been made for the third annual Fox River Valley Safety Conference, which will be held this year in Sheboygan, Wisconsin, June 14. Prominent paper men are to play an important part on the program of the Paper and Pulp Section, which opens at 9:45 A. M. at the Rex Theatre with Chairman "Bill" Peacock presiding.

Otto H. Rachals, foreman at the Northern Paper Mills, Green Bay, will open up the program with a talk on "A Program of Safety in the Yard," and will be followed by C. K. Boyer, superintendent of Interlake Pulp and Paper Company, Appleton, who will speak on "The Wood Room Crew Asks No Odds."

Thilmany Pulp and Paper Co., Kaukauna, Wis., will be represented by R. M. Radsch, superintendent, whose topic is "Safe Practices in The Pulp Mill," and he is followed by A. C. Remley, general manager of the Patten Paper Co., Appleton, Wis., whose talk is entitled, "Habits of Safety on The Paper Machines."

"Placing Responsibility for Accidents," is the title of the talk to be opened by M. G. Hoyman, staff superintendent of service at the Kimberly-Clark Co., Neenah, Wis., and a movie, "Hindsight vs. Foresight," will be the concluding part of the Paper and Pulp Section meeting.

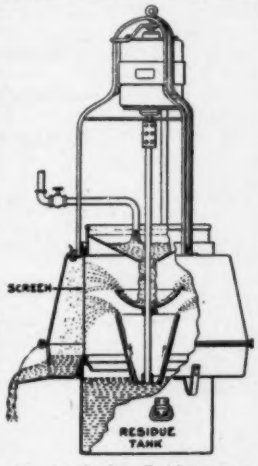
At the same time the Paper and Pulp Section is in session the Public Utilities Section, Metal & Metal Working Section, and Wood-working Sections are all to be in session at various meeting places. A general session is to be held at 2:00 P. M. in Eagle's Auditorium, where Chairman George Opp, Chairman of Public Utilities Section, National Safety Council, will preside. There will be talks on "What Accident Prevention Means," by R. G. Knutson, Commissioner Industrial Commission, Madison, Wis., "Fire a Menace That Never Sleeps," by R. E. Vernor, Manager of Fire Prevention Dept., Western Actuarial Bureau, Chicago, Ill., and "Every Foreman a Safety Director," by G. A. Keuchenmeister, Safety Director, Dominion Forge and Stamping Co., Ltd., Walkerville, Ont., Can. A general round table discussion will conclude this meeting, where all questions on safety written on cards distributed at the morning sessions will be answered.

The evening session to be held in Eagle's Auditorium at 7:45 P. M. will have F. M. Wilcox, Chairman of Industrial Commission of Madison, Wis., presiding. There will be entertainment, and an address on "Safety in the Cause of Humanity, Our Job," by A. C. Backus, Publisher, The Milwaukee Sentinel, Milwaukee, Wis.

Sheboygan, one of the most thriving industrial centers of the Middlewest has thrown wide its doors to welcome this safety conference, and make it the best of any that has ever been held, and it is expected large numbers of men in our industry will take this opportunity to attend.

New Machine for Screening Clay and Color

Paper manufacturers, to whom the cleanliness of the clay and color used in their processes means the success or failure of their whole product, are becoming increasingly interested in the piece of equipment which has been brought out in the last year by the Rotospray Manufacturing Company, of 358 West Madison Street, Chicago. This "Rotospray" clay and color sifter was designed for the exact purpose for which it is sold: the screening of clay and color, quickly and efficiently. It may be, however, and is being applied to the screening of fluids of any description.



An entirely new principle is employed in the construction and operation of this machine. The screen is stationary in a vertical, cylindrical position, and the fluid is sprayed through the screen by a revolving spray head. Due to centrifugal action, fluid is immediately converted into a fine spray and projected through the screen. Part of the fluid passes through the screen and the rest of it runs down into a residue tank underneath, from which it is pumped up again by the revolving cone, and it is again sprayed through the screen.

This action of the fluid running down on the inside of the screen automatically keeps the screen clean. This action continues, automatically, as long as the material is fed to the screen. When, however, the residue tank is full of unscreenable material, it must be emptied. The size of the residue tank is such that it will hold the rejected material from between two and three thousand gallons of material screened, depending upon the proportion of impurities to be eliminated. In practical operation in the mills, the tank is usually emptied after each batch.

The "Rotospray" is entirely of aluminum and is equipped with a one horse-power General Electric ball-bearing motor, 1800 r. p. m. This requires oiling about once a month. Aside from the motor bearings, there are no bearings to be taken care of.

The machine is not a vibrating machine, and it runs as quietly as any stationary standard motor. It is transportable, weighing only about ninety pounds, and can be hung up or stood on the floor. There are no wearing parts on the machine to be replaced, with the exception of the screen. In this type of machine, moreover, the life of the wire cloth is exceptionally long. In one instance the screen has lasted several months.

It is significant that the mills which have bought one machine for a try-out have come back for enough machines to handle the whole supply of clay and color for their process. The "Rotospray" is rapidly acquiring a reputation in the trade for efficiently eliminating the foreign matter from these materials with a minimum of power cost or upkeep expense, and it is now in operation in many of the largest mills.

Approximately a million acres, or about sixty billion feet, of redwood remain in California. At the present rate of consumption the redwood will last about a hundred years.

Do your rolls last as long as they should?

Butterworth Long Wear Calender Rolls have been known to the textile industry for two score years for their ability to give extra hours of service.

These same rolls are now available to the paper industry —and in some of the largest paper mills of the country are giving 1500 hours on glassine.

Literature fully describing Butterworth Long Wear Rolls will be sent promptly upon request. We shall also be glad to quote on Butterworth Long Wear Rolls—despite their quality, they are not high priced.

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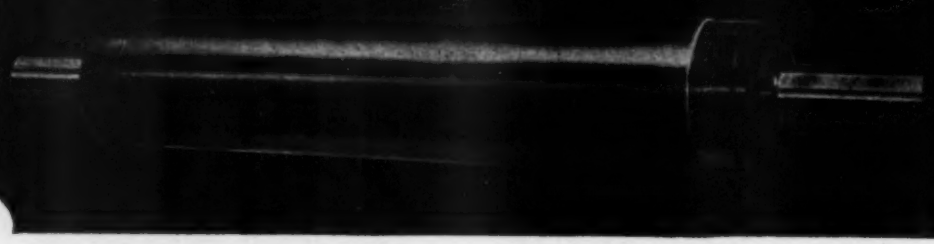
For the Paper Industry



BUTTERWORTH *Calender* ROLLS

Conference on Pulp and Paper Statistics

Consumption trends on numerous grades of paper are at present difficult to determine because of conflicting methods of computing and a certain lack of standardization in the work of compiling statistics. In some cases no current statistics are available, and in others, grades are grouped in such a manner that changing classifications have made it almost impossible to arrive at any accurate determination of trends of production, consumption or capacity. Recognizing this the American Paper and Pulp Association, under the direction of Hugh P. Baker, executive secretary, and Paul S. Hanway, statistician, arranged recently for a conference of a number of the ablest statistical men of the pulp and paper industry.

Invited to the conference were: C. B. Morgan, S. D. Warren Company; R. S. Kellogg, News Print Service Bureau; G. A. Ware, News Print Service Bureau; E. O. Merchant, G. H. Mead Company; A. J. Stewartson, Wrapping Paper Manufacturers' Service Bureau; Jessup & Moore Company; Grellet Collins, Dill and Collins Company; Stanley Byron, Hammermill Paper Company; H. C. Scott, International Paper Company; M. C. Dobrow, Writing Paper Manufacturers' Association; Grafton Whiting, Paperboard Industries Association; Henry A. Dickie, Paperboard Industries Association; D. A. Wilcox, Oxford Paper Company; C. E. Dobson, Southern Kraft Association; J. R. Hinkson, Hampden Glazed Paper & Card Company; Mortimer B. Lane, Survey of Current Business, Department of Commerce; D. A. Crocker, American Paper and Pulp Association; T. J. Burke, Cost Association of the Paper Industry; O. M. Porter, Glazed & Fancy, Binders Board, U. S. Pulp Producers Association; P. S. Hanway, statistician, American Paper and Pulp Association.

In planning future expansion or production programs, the determination of consumption and production trends are of the utmost importance to manufacturers of pulp and paper, and it was evident from the start that adequate information could be obtained only by men of experience and ability representing all grades of paper such as those listed above.

The conference was held on April 8 at the rooms of the American Paper and Pulp Association, with a gratifyingly large attendance, some fifteen being present, including Mortimer B. Lane, editor of Survey of Current Business, U. S. Department of Commerce. Several who found it impossible to attend sent letters offering co-operation in the work as outlined.

C. B. Morgan, treasurer of S. D. Warren Company, was made chairman of the conference. As explained by Mr. Hanway, it was not intended in the new statistical work to conflict in any way with present statistical methods as used by the various associations in the paper industry. The purpose in view was the promulgation of a plan of collecting statistics which would make for greater clarity, standardization and value for the pulp and paper industry as a whole.

The results of the conference were considered extremely gratifying to all concerned. Inasmuch as practically every major group of the industry was represented, it was felt that each grade should be considered separately in recommendations to be made and that such suggestions be approved by the proper authorities because of such representation.

Among the major subjects discussed and refered to committees afterwards appointed to consider resolutions were the following:

1—Standardized form for production capacity which would also be the normal production capacity of the plant. This, it was pointed out, would eliminate present methods of numerous and diversified forms or methods of establishing normal capacity and make for a uniform method so that hereafter reports to the association for all grades of paper would be on the same basis.

2—An annual census for paper and pulp products in more comprehensive form to give recognition to grades of paper which merit classification and which have up to the present time been more or less overlooked.

3—Revision of present form of wood pulp and pulpwood census report.

4—Request an annual census of converted papers by the Bureau of the Census.

5—Centralized report forms on a unified basis to be received through the American Paper and Pulp Association and the association's monthly report on paper and wood pulp to be changed to correspond with the new forms.

6—The question of contract orders, blanket orders, orders received, etc., and the determination of the most logical method for reporting such orders in a uniform manner.

Another group meeting was held on May 18 when composite proposals were presented for final approval as recommendations of the pulp and paper industry for changes in the census of paper, pulp and converted materials.

The subject is one of vital interest. It merits the co-operation of every mill in the paper and pulp industry.

Recognizing the importance of the subject, the Department of Commerce has appointed A. H. O. Rolle, of the Division of Manufacture, Bureau of the Census, to co-operate with the committee in helping them by suggestions and experience in determining which forms would be most suitable, not only to the government but to the industry as a whole. Co-operation of this kind brings the government and the industry into closer relationship and beneficial results cannot help but result. Considerable help has already been received from the various departments at Washington and the promise of further co-operation is very gratifying to the men in the industry who were responsible for inaugurating the movement.

Graphic Arts Exposition Nearing

What promises to be the most comprehensive presentation of printing and its allied industries, is the 4th Educational Graphic Arts Exposition, to be held in Grand Central Palace, New York City, September 5-17 next. All indications point to it being the most successful exposition of its kind, and paper manufacturers as well as printing men and those making products for the printing industry, are expressing an intense interest in the show.

The impressive poster announcing the exposition is symbolic of the strength of the printing and allied industries today—a mighty black figure with colored lettering announcing the exposition to be held soon. There will not be another exposition of this kind for five years, with similar opportunity to present products and printing developments before the public eye.

Finding the oldest printer in America is only one of the interesting sidelights of the exposition, and the lucky person, if he resides a reasonable distance from New York, will be invited to the exposition, and publicly presented with a medal or some such suitable reward. If unable to attend, the appreciation of his long service will be sent to him.

Realizing the important part advertising typography plays in the business world, the management of the 4th Educational Graphic Arts Exposition, has arranged a display of the foremost work in newspaper and magazine advertising typography. This particular department will be a prominent feature in the grouping of printing displays under the general title "The Graphic Arts Gallery." While no prizes will be awarded, special attention will be given to crediting newspapers, magazines, printers and advertisers with the production of the specimens exhibited. With this exhibit of newspaper and magazine advertising typography, will appear exhibits of engraving and lithographing. All exhibits will be in classified groups so that visitors can see the kind of work particularly interesting to them. The groups will include (1) books and book binding, (2) institutional books, (3) commercial printing, (4) process illustration and color work, and (5) offset, aquatone and lithographic printing.

An elaborate souvenir program and guide to exhibitors will be issued by the Club of Printing House Craftsmen of New York. Aside from its unique makeup and illustration, it will contain the only official list of exhibitors with their booth numbers and a brief story of their commercial activities and products. A complete history of the six organizations holding their conventions in New York at the same time as the exposition will also be contained in this book.

The International Association of Printing House Craftsmen, United Typothetae of America, International Association of

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GRAPHIC ARTS EXPOSITION

GRAND CENTRAL PALACE — New York City
September 5-17, 1927

THE EXPOSITION will make new history in the world of graphic arts. On three floors of Grand Central Palace will be a most complete presentation of printing and its allied interests. The exposition will illustrate in a surprising manner the enormous strides made in the industry. World-wide interest has been manifested and leading manufacturers have arranged comprehensive exhibits. ¶The management has planned a most unusual display of features which will attract the trade and public. Annual conventions and meetings of the leading associations will be held coincident with the exposition assuring the right kind of attendance. Under no other conditions could direct contact be made with so many prospects. ¶Not merely the printing world, but the world that uses printing, will visit the exposition. There will be prospective customers of the most desirable type. ¶Secure your space while there is yet time to do so. It will be several years before another exposition of this character and scope will be held. Act now! ¶Plan to come—Come to buy, to sell, to meet old customers and friends, to make new ones. This is *your* exposition. Be an active part of it. Its success will reflect credit on the entire industry.

NATIONAL GRAPHIC ARTS EXPOSITIONS, *Inc.*

461 Eighth Avenue, New York, *Room 1916*

A. E. GIEGENGACK, Exposition Manager **TELEPHONE LACkawanna 5831-2**

The following associations, by whom the 4th Educational Graphic Arts Exposition has been organized, will convene in New York coincident with the Exposition

THE INTERNATIONAL ASSOCIATION OF PRINTING HOUSE CRAFTSMEN
INTERNATIONAL PRINTERS SUPPLY SALESMEN'S GUILD
INTERNATIONAL ASSN. OF ELECTROTYPERS OF AMERICA
UNITED TYPOTHETAE OF AMERICA
INTERNATIONAL TRADE COMPOSITION ASSN.
EMPLOYING BOOKBINDERS OF AMERICA

Electrotypers of America, Employing Bookbinders of America, International Trade Composition Association, and International Printers Supply Salesmen's Guild, will all be in attendance at the Exposition, as their respective conventions take place during the time of the Graphic Arts show. Advertising men, magazine and newspaper men, executives of large corporations, and a number of persons representing the buying power of important organizations will all be present. An opportunity to show products to such a group should be especially attractive.

Committee on "Training for the Industry"

The success of any industry is measured by the ability and training of the men who are identified with it. Nature endows them with the former but they get the latter only by study and experience, says Allen Abrams, Chairman of the T. A. P. P. I. committee on Training for the Industry. Unfortunately, he adds, it has been true in the past that men in industry were divided pretty clearly into two classes—the mill trained practical man who acquired his information from direct contact and hard knocks; the college man who derived his knowledge almost entirely from books. Is it any wonder that these two have had such diverse points of view that they failed to agree?

Today there is a very distinct recognition of this handicap so that we have the attempt to better it on the one hand by giving the practical man an opportunity to overcome his shortcomings by further study in correspondence courses and by attendance at group meetings; and on the other hand, universities are recognizing the fact that their students must have a better grasp of the practical aspects of industry and that they must get this by actual contact.

The Massachusetts Institute of Technology has a well defined plan for its chemical engineering students whereby the student spends four years in an under-graduate course. In the fifth year he puts in six months of plant study and testing under supervision, followed by six months of advanced study at the Institute. Groups are small enough and the industries so widely diversified that the student is assured a thorough grounding in unit operations, such as filtering, washing, drying and the like.

The University of Cincinnati has approached the problem from a different angle. The student is required to put in five years during which time he spends, alternately, two weeks in the school room and two weeks in the shop. In this way he co-ordinates theory and practice; and, since he is engaged in productive labor, he is paid a wage which helps in defraying expenses.

Both plans are working effectively and both are training a certain number of men for the pulp and paper industry. Since, however, the number of men so trained is relatively small (partly because of the time required) and since there is a growing demand for better trained men in the pulp and paper industry, it becomes necessary to look about for additional methods.

The suggestion has been made that promising men, selected in their freshman year at college, might be put to work in pulp and paper mills for about two months each summer; with the purpose in view of finally accepting positions in the industry. To meet the diversified needs, men should be chosen from various courses, including mechanical, electrical and chemical engineering; chemistry; commerce, etc., the number depending on the demand.

The Committee on Training for the Industry has arranged a meeting in Madison, Wis., on Saturday, June 4, which was attended by the committee men (who are thoroughly familiar with the needs of the industry) and also by a number of prominent educators. It is proposed to outline a definite working arrangement between the university and the industry.

Stock Preparation and Beater Control

A new committee of the Technical Association has been formed, with George K. Spence as chairman, for the study of problems pertaining to stuff preparation or beating control, and Mr. Spence has sent out a statement concerning the work of the committee, which it is expected will be of great benefit to paper manufacturers. He has selected a limited number of coworkers on the committee for the first year, all of whom are men of experience and capable of planning future work. The members who have been asked to serve include Grellet N. Collins, C. Nelson Gain, E. P. Gleason, A. W. Nickerson, R. W. Pattison, J. E. Plumstead and J. J. O'Connor. In outlining the work of the committee, Mr. Spence says:

"The work of this committee will cover control of furnish of sulphite, soda, rag and groundwood pulps, as well as deinked papers, together with methods in use for deinking old papers and preparing the stock for the beaters, the control to include alkalinity, chlorides, collodial stock, etc.; time element in beating; effect of beater temperature on stock for various purposes; effect of density on time of hydration; hydrogen-ion control; quick methods for determining nature of stock before passing from the beaters, including consistence and freeness testers, hand sheets, etc.; effect of jordans as compared with beaters; mechanical devices for recording the action of beaters; coloring, sizing, and loading, together with methods for controlling amount used; benefits derived from the use of silicate of soda, starchy materials, animal size, etc.; form and slime preventatives and many other problems relative to control of stock prepared in the beaters for the paper machines."

New Jersey-Penna Supers Reorganized

Steps have been taken to reorganize the New Jersey-Pennsylvania division of the American Pulp and Paper Mill Superintendents' Association. This division has not met since it was formed upwards of a year ago, which was commented on by President Rooney in his annual address to the national association at the meeting in Richmond on May 26. Spurred by his comment, a meeting of the members from New Jersey and Pennsylvania was held at the Jefferson Hotel in Richmond shortly before the national convention adjourned, when a new board of officers was elected and committees named to insure an early resumption of activities. As officers to serve during the ensuing year the following were chosen:

Chairman—Charles L. Ellis, Downingtown Manufacturing Company, East Downingtown, Pa.; vice chairmen, S. C. Wentz, P. H. Glatfelter Company, Spring Grove, Pa., and J. E. Blosser, Scott Paper Company, Chester, Pa.

Secretary—John A. Bowers, Hammermill Paper Company, Erie, Pa.

Treasurer—Ward M. Smith, Container Corporation of America, Philadelphia.

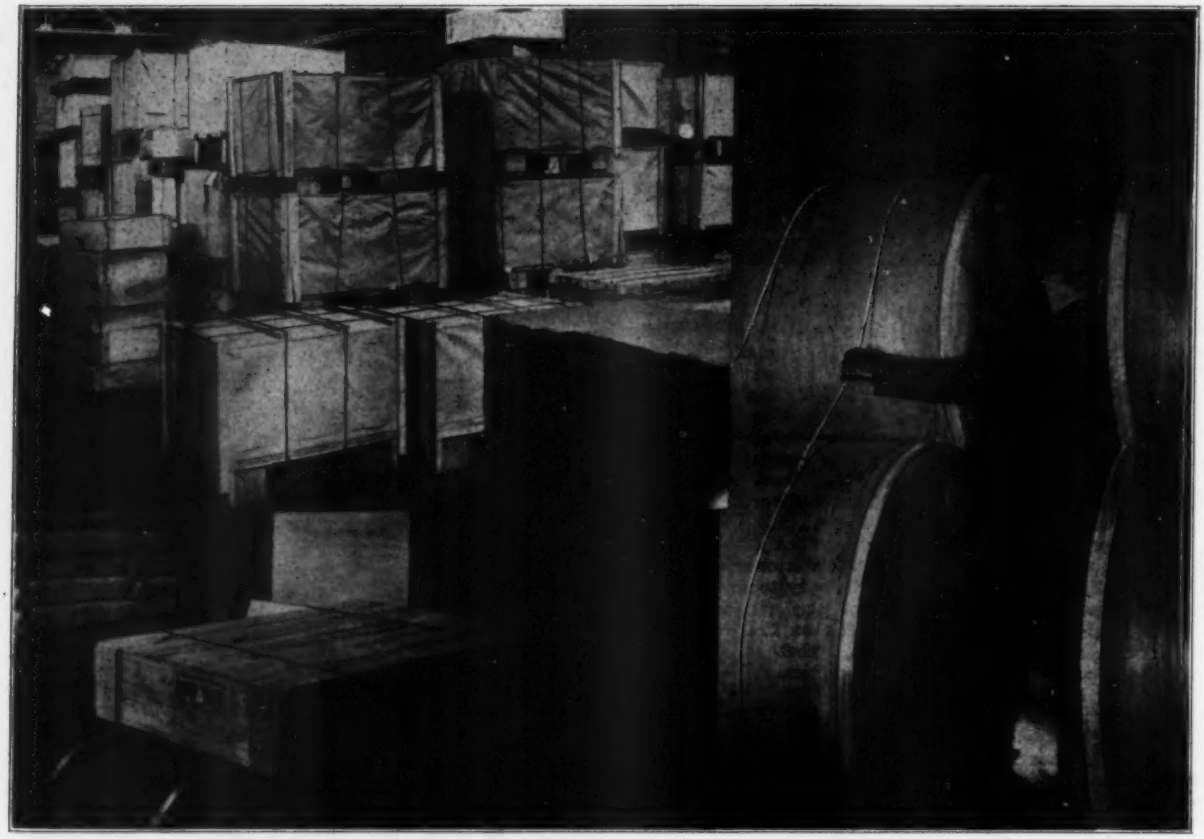
Board of Governors—Frank H. Winslow, General Electric Company, Philadelphia; A. A. Mintle, Valve Bag Company of America, Oakmont, Pa.; William H. Sutherland, Penn Fibre Board Company, York, Pa.

A **Committee on Papers** was named as follows: James F. Collins, Bogota Paper & Board Company, Bogota, N. J.; John F. Baker, Clifton Paper Company, Passaic, N. J.; Joseph E. Plumstead, Jessup & Moore Paper Company, Wilmington, Del.; Robert Knowles, Reading Paper Mills, Reading, Pa.; George L. Bidwell, Warren Manufacturing Company, Riegelsville, Pa.

It was decided to hold a meeting of the New Jersey-Pennsylvania division in Newark, N. J., on Saturday, September 17, for which a **Committee of Arrangements** was named as follows:

Thomas F. Martin, Hamersley Manufacturing Company, Garfield, N. J.; Joseph H. Dow, Eastwood Wire Manufacturing Company, Belleville, N. J.; J. W. Outerson, Paterson Parchment Paper Company, Modena, Pa.; Arthur F. Allen, Tidewater Paper Mills, Brooklyn, N. Y.; Wallace C. Amerine, Elizabeth, N. J.; Frank Ball, Manhattan Rubber Co., Passaic, N. J.

Public hearing will be held to discuss the proposed standard for "Sulphate Wood Turpentine" for which no standard is established by the Naval Stores Act. The meeting will be held at the office of the Food, Drug and Insecticide Administration, U. S. Dept., of Agriculture, 216 13th St., S. W. Washington, D. C., August 15, 1927, at 10 A. M.



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One manufacturer is saving about $50,000.00 per year by adopting the Gerrard recommendations for shipping flat paper stock on skids instead of in cases. A newsprint shipper saves $15,000.00 yearly by eliminating the old method of wood bracing and the resulting loss and damage claims. A shipper of bales cut costs 60%—a direct saving of 13c per bale.

If your shipping costs are high—if claims are mounting up—let a Gerrard expert estimate the savings that the Gerrard Method will effect in packing and shipping your product. The result will be an agreeable surprise. Will you write us today?

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The Month at Washington

Washington, D. C., June 1, 1927.

THE Third Pan-American Commercial Conference closed its sessions in Washington with the adoption of resolutions aimed at the reduction of high tariffs levied by countries of North and South America in the interchange of their products, and the elimination of other barriers to inter-American commerce. The outstanding problems of the conference, which meets again in four years time, were the simplification and standardization of consular and customs procedure. Provision was also made for the arbitration and settlement of trade disputes or differences which might arise between the merchants of the different countries. Parcel post commerce and the wider use of the metric system were advocated by the conference.

New Trade Digest.—General economic information regarding foreign countries alphabetically arranged from Algeria to Yugoslavia, is contained in a mimeographed source book of information just issued by the Department of Commerce. Geographic and economic facts, including area, climate, language and leading industries, are stated in the compilation, copies of which are obtainable upon application to the Bureau of Foreign and Domestic Commerce.

New System For Patent Appeals.—The reorganized Board of Patent Appeals, provided for in a recent act of Congress, began functioning during the month as the sole patent appellate tribunal of the Patent Office, replacing the former dual method of appeal which it is expected will result in an important simplification of procedure and so benefit American trade and industry. The new method will eliminate approximately one-half of the procedure and time formerly required in appeal cases.

Income Tax Ruling.—A ruling on reserve for bad debts, under the 1921, 1924 and 1926 revenue acts has just been issued by the Bureau of Internal Revenue (Mim. 3527) by which taxpayers in adopting the reserve method of treating bad debts for taxable years coming under the Revenue Acts of 1921 and 1924 are not required to determine the amount that should reasonably have been set up at the close of the taxable year preceding that in which they elected to use the reserve method, and are not permitted to deduct from gross income debts that were outstanding at the close of such preceding year and were ascertained to be worthless in whole or in part, and were charged off during the taxable year in which they elected to use the reserve method.

For the taxable year in which the election to use the reserve method is made or permission to change to such method is obtained, in accordance with the provisions of the regulations, a reasonable reserve for bad debts may be set up and deducted. Under the reserve method, a reasonable addition to such reserve may be deducted for each subsequent year.

What constitutes a reasonable reserve for bad debts or a reasonable addition thereto must be determined in the light of the facts in each case. Consideration should be given to the volume of charge sales or other business transactions for the taxable year and the percentage of the reserve to such amount, the total amount of notes and accounts receivable at the beginning and close of the taxable year, and the amount of debts which have been ascertained to be wholly or partially worthless and have been charged against the reserve account during the taxable year.

Articles 151 and 155, Regulations 69, should be followed in cases coming under the Revenue Act of 1926.

Growth of Manufactures.—Measured by quantity or physical volume of goods produced, the output of manufacturing industries in the United States increased 163 per cent between 1899 and 1923, according to a study of census figures just completed by Edmund E. Day of the University of Michigan and Woodlief Thomas of the Federal Reserve Board, which will be published under the title, "The Growth of Manufactures," as one of the series of Census monographs, and may be procured upon application to the Department of Commerce.

Process Developed to Reclaim Newsprint.—A process of reclaiming newsprint to make it usable a second time by removing the ink from the original printed paper is claimed to have been perfected in Germany. Heretofore, the difficulty in deinking newsprint has been in the removal of the lamp black which is an important ingredient of the printers' ink as now produced. The German patent concerns the making of printers' ink under a different process whereby pyrolusite is used, which is fast to light and air. This pyrolusite is introduced into oil or color varnish. Without further treatment pyrolusite produces a brownish print, unwelcome to the trade, but this can be deepened to a black tone if mixed with certain fat-soluble light reducible organic colors. The preparation is then treated with sulphite or a 1 per cent hydrous sulphurous acid which, it is claimed, removes the black color completely within the space of one-half of an hour. A light blue print which remains is said to disappear in the pulping process accompanying final regeneration to white stock. American patents are now pending.

Waste of Pulp Mills Utilized in Tanning.—Researches by the Bureau have resulted in the discovery of a treatment for leather which may be of benefit to the industry. The researches were centered on the conversion of waste organic matter that is run off into the streams from pulp mills. This research has shown that these waste liquors can be so treated as to produce a material suitable for use in making leather. As a result, the paper mill manufacturer will benefit through the utilization of a waste product the disposal of which has become a serious problem because of stream pollution.

Weights and Measures Conference.—The 20th national conference on weights and measures was held at the Bureau of Standards beginning May 24, and was attended by representatives of state, city and business agencies with responsibilities of this kind. The conference has been fostered by the Bureau as the best means of promoting uniformity of law, regulations and methods of testing and their enforcement throughout the country. The conference is also a clearing house of information and offers a forum for the full and free discussion of weights and means problems of all kinds.

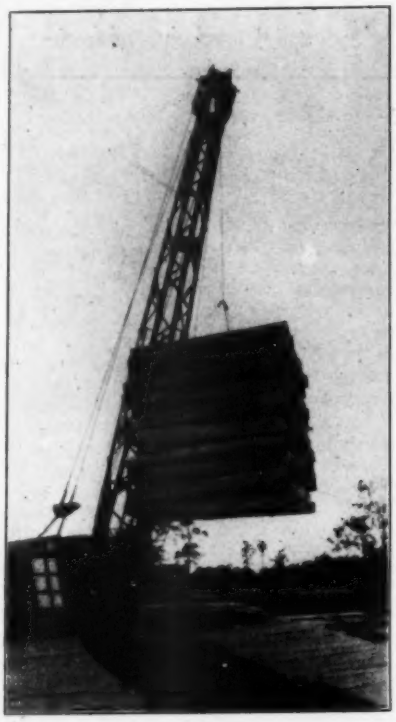
Revision of the Revenue Acts.—The first meeting of the advisory committee called to consider proposed changes in administrative features of the various revenue acts, met at the Capitol on May 24 to consider certain problems relating to taxation which may be the subject of proposed legislation in Congress next December.

Fuller Utilization of Wood.—The National Committee on Wood Utilization has approved eleven reports of sub-committees, each embodying a program to promote fuller use of forest products. The pulp and paper sub-committee reported their conclusions, proposing to study the possibility of utilization and the economic limitations of little used species and other fiber materials, not with the idea of stimulating use but to present the facts as to what is being done.

Recession in Wholesale Prices.—Index numbers of wholesale prices by groups and sub-groups of commodities (1913-100.0) are here shown:

	1926	1927
Miscellaneous	April	March
Paper and pulp	175.3	154.8

Western National Forests.—"The National Forests of California" is the title of a bulletin just issued by the Forest Service as Misc. Cir. No. 94-M, showing the annual value of the lumber and pulp products of the state, valued at about 62 million.



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From the standpoint of the paper man, wholesale handling is essential to the production of paper.

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Catalogues, Booklets, Etc.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—Leaflet No. 2092, entitled "Texrope Drives in Pulp and Paper Mills," should be of interest to the industry in learning about the application of this particular drive in pulp and paper mills. It will be sent upon request.

American Blower Co., Detroit, Mich.—"Sirocco Blowers for Oil Burners," is the name of a new bulletin issued by this company, as No. 1033. It contains capacities and dimensions charts for small sirocco wheels, and sirocco fans for oil burners, as well as containing illustrations of practical applications of the device.

Barrett-Cravens Co., Chicago, Ill.—Platform equipment, so essential a part in any plant, is discussed in an attractive catalogue, covering the Barrett-Cravens line of "Steeleg" platforms, and featuring special types for special applications. This company brings out the particular advantages of individual and special construction according to needs of the equipment, and will be pleased to send their handsomely illustrated catalogue with explanations of their line, upon request.

The Bristol Co., Waterbury, Conn.—"Pyrometer Instruction," Bulletin No. 358, should be extremely helpful to users of Pyrometers, and particularly Bristol Pyrometers. Detailed information on installation and care of the instruments, with fine charts and checking equipment should be especially valuable.

H. W. Caldwell & Son Co., Chicago, Ill.—A typical Caldwell product, the new Caldwell Speed Reducer, is illustrated and described in Booklet No. 630 just off the press. Diagrams, illustrations, and statistical material comprise the booklet, with detailed information on the utilization and manipulation of the product itself.

Dean Hill Pump Co., Anderson, Ind.—Circular 403 has just come to us, and describes in detail the construction of their new line of ball bearing double suction centrifugal pumps. They will be pleased to send it to our readers upon request.

Department of Commerce, Washington, D. C.—"Paper and Paper Products in Colombia, Venezuela, Ecuador, and the Guianas," is a report constituting a brief survey of the paper trade in these markets based on reports from overseas representatives of the Departments of State and Commerce. It may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents. It is called Trade Information Bulleton, No. 477.

General Electric Co., Schenectady, N. Y.—Five leaflets from this company, and all of them concisely described and illustrated. GEA-6, "G-E Squirrel Cage Motors;" GEA-250, "Drum-type Control Equipment;" GEA-530-A, "Type MT Control Equipments;" GEA-570, "Hand Starting Compensators;" and GEA-753, "CR 9511 Shoe-Type Solenoid Brakes," will be sent upon request to those interested.

Graver Corp., East Chicago, Ind.—The title of a new 48 page catalogue just issued by this company is "Bulk Storage Tanks," and it contains a great many illustrations of bulk stations of every type, with a list of standardized tank sizes with specifications for all types. Several pages are devoted to fittings, and bulk station layouts. A section on the care of tanks is especially interesting. Copies may be obtained by writing to Graver Corp.

International Combustion Engineering Corp., New York City.—"5,000,000 Pounds of Steam per Hour from One Unit," is Publication IC-2, which describes in interesting manner the work of remodeling one of the large steam generating units at the Fordson Plant of the Ford Motor Co. To all interested in International Combustion Systems, this book should be of interesting value.

Metropolitan Life Insurance Co., New York City.—"Functions of The Office Manager," is No. 6 of a series which is meeting with very much interest to all readers. Policyholder's Service Bureau, Metropolitan Life Insurance Co., N. Y. C., will be pleased to send this booklet describing duties and giving charts on the position of office manager.

Parsons & Petit, New York City.—Freeport Sulphur Company has just issued their annual statistical card on sulphur, pyrites and sulphuric acid, including sulphur exports, prices, etc., for 1926, through Parsons & Petit, selling agents at 63 Beaver St.

Revolator Co., Jersey City, N. J.—Their latest bulletin No. 91-A, "Arc Welded Revolable Base Machine," will be sent upon request. It contains dimensions, illustrations, and descriptions of the Revolvator Hand Power Model Revolvable Base.

Revision of Classification and Definition Report

The progress which the American Pulp and Paper Association is making in compiling accurate and complete statistics for the industry has emphasized the necessity of better classification and better definitions of paper.

In 1923, when the association appointed separate committees on the classification of paper and definitions, the committee got out a comprehensive report which was afterwards reprinted and put out in book form, and this report was the first comprehensive effort made to state accurately definitions of paper and a workable classification. The past three years have emphasized errors in the original reports and, therefore, necessity for revision.

To bring about a revision of the report of 1923 on Classification and Definitions of Papers, D. C. Everest, president of the American Paper and Pulp Association, has just announced a new committee to carry through a revision of the 1923 report. The committee is about to beign its revision of the previous report and it bespeaks the co-operation and help of the entire industry in what promises to be an exceedingly important piece of work.

Hoover Pays Tribute to Industry

At the meeting of the National Wood Utilization Committee recently, Secretary Hoover paid a fine tribute to the wood-using industries by stating that the importance of self-government in industry was evident, and the wood-using industries had pointed the way for other industries by their splendid co-operation over a period of years, embracing standardization as well as utilization.

He further complimented this industry by stating it is Exhibit A of the Government by co-operation, and that it has never sought to obtain contributions from others, but to produce work of the industry itself.

Noble & Wood's New Beating System

Noble & Wood Machine Co., Hoosick Falls, N. Y., is ready to offer to the paper industry a new beating system. It is said that this system is entirely different, and said to posess several unique features not heretofore found in other high capacity, high density beaters.

According to reports from them, this system is said to increase the output of a beater a little over three times, cutting the investment in beater room space to approximately two-thirds, reducing friction, lubrication, and power costs.

Noble & Wood Machine Co., states that it is possible to convert a 1400 lb. beater to one of these 4600 lb. new high density beater in from 12 to 15 days. They also assert that in one mill where this new system is in operation, it has increased production from 44 tons to 60 tons of kraft paper in 24 hours, besides being able to make a new grade of product testing from 15 to 18 per cent. higher in Mullen and Tear than before.

The Samuel C. Rogers & Co., 10-16 Lock St., Buffalo, N. Y., have moved into their new plant at 191-205 Dutton Ave., Buffalo, N. Y. The move into the new plant accomplishes the successful culmination of several years operation in the manufacturing field, and their subsequent necessity to increase production facilities.

The Cincinnati office of General Naval Stores Co., with O. E. Busener as manager, has been moved to the North Side Bank Bldg., 4125 Hamilton Ave., Cincinnati. This will also be the location of the Technical Division and Research Laboratory under the direction of E. V. Romaine, Technical Director.

Builders of High Class

PAPER MAKING MACHINERY

I. P. Morris and Pelton Hydraulic Turbines and Accessories.

Modern High Speed Newsprint Machines embodying the following Special Features:

- Van de Carr Slices.
- Oscillating Suction Boxes.
- Beloit Type Removable Fourdrinier
- Suction Couch Rolls (Millspaugh Type)
- First and Second Suction Press Rolls (Millspaugh Type)
- Canadian Granite Top Press Rolls
- Patented Internal Cantilever Anti-friction bearings for Table, Wire and Wet Felt Rolls.
- Special Mechanism for driving Dryers, assuring safe running at high speeds.

P 27

DOMINION ENGINEERING WORKS LIMITED

MONTREAL CANADA

Canadian News

Consolidation of Newsprint Sales

An announcement of major importance to the Canadian newsprint industry was made recently in the incorporation of the Canadian News Print Co., Ltd., with head office in Montreal. The new company, which has a capitalization of $5,000,000 preferred stock and 10,000 common shares of no par value, has arranged to acquire the G. H. Mead Co., the Canadian Export Paper Co., and the St. Maurice Sales Co., Ltd. Through these subsidiary companies, the Canadian News Print Co. will have for sale a daily output of approximately 5,000 tons of newsprint, being the combined production of the following Canadian mills: Laurentide, Price Bros., Port Alfred, St. Maurice Valley Corp., Ste. Anne Paper, Spanish River, Fort William, Manitoba Paper, Abitibi, and Anglo-Canadian.

The aim of the new sales company will be the energetic broadening of the market for Canadian newsprint through the development of overseas business. Through the merger it is felt three factors will contribute toward economical distribution, namely, lowering of selling costs due to the elimination of duplication in selling effort, saving in freight by shipping from the mill best favored by geographical location, and better service to publishers with quick and assured deliveries. The new company will handle products of mills well located with reference to the American market, as well as the export market with six mills located on tidewater.

The directors of the new company are Geo. Chahoon, Jr.; Sir Herbert S. Holt, Geo. H. Mead, Alexander Smith, John H. Price, J. H. Gundy, G. H. Montgomery, Frank W. Clarke, W. N. Hurlbut. The officials are: W. N. Hurlbut, president; E. L. Crooker, vice-president; T. T. Walker, vice-president; Frank B. Common, secretary. Percy B. Wilson, vice-president of Spanish River, has been appointed general manager and has taken up his new duties.

Reduced Output May Prevent Price-Cutting

Newsprint exports, as shown by the monthly reports of the Canadian Pulp and Paper Association, are keeping consistently ahead of the corresponding period of 1926, and there seems to be but little ground for the alarmist warnings of impending disaster on account of over-expansion. The increase in demand of late years has been so tremendous that it is a great credit to the Canadian newsprint industry that it should have succeeded in filling it. It is now looking ahead and preparing to meet all demands that are likely to be made upon it, but at the same time it is taking care that the unavoidable overlapping between production and consumption, which must occasionally take place under present conditions of growth, shall not work any serious detriment.

The formation of the Canadian Newsprint Co., which controls the sale of over half the output of the Canadian mills, should certainly be very useful in this respect. Moreover, various conferences have been held in Montreal recently, between representatives of leading newsprint interests in the matter of limiting output. The meetings have been convened with the idea that the present surplus capacity of the mills should not result in placing a large surplus production on the market. It is reported that a plan is being drawn up which will definitely limit the production of the machines of a large percentage of the newsprint mills. Machines which have been in operation over a term of years will, under the scheme, operate near capacity, and those which have come into operation comparatively recently will reduce their output. It is thought that in this way machines which shortly will be completed will not come into operation until such time as the increasing demand allows them to produce.

In the meantime, strenuous denials have been made from "authoritative sources" of the rumor in a news item from New York that a cut of $5 per ton in newsprint prices is imminent. No consideration, it is stated, has been given to any suggested cut in price, nor will such consideration be given, as the leading companies have already contracted for their output for the current year at $65 per ton.

Australian Trade May Be Changed

Large scale experiments are now being made in Australia to demonstrate the possibility of developing a pulp and paper industry in the Commonwealth. At a recent meeting of the shareholders of Amalgamated Zinc (de Bavay's) Ltd., proposal of the directors was endorsed which includes taking up a 60 per cent interest in a new company which has secured cutting rights in the eucalyptus forests of Tasmania, a satisfactory arrangement for power, a mill site and port facilities.

The success of these experiments will mean the imposition of a high tariff on imported papers, which will have an immediate reaction in Canada where a large pulp and paper export trade is being built up under the 1925 trade treaty, permitting free entry of Canadian newsprint into that country.

Requests for Increased Duties

An application has been made to the Tariff Advisory Board at Ottawa for higher duties on lithographed and printed articles. W. S. Campbell, chairman of the tariff committee was the chief spokesman, who suggested increases in duties on various classes ranging from 8 to 20 per cent, and bringing the general tariff on dutiable goods covered by the application to 30 per cent. A request was also made to the Tariff Advisory Board for a duty of 25 per cent on imports of twine or yarn made from paper. The companies associating themselves with the request were the Wayagamack Pulp and Paper Co., E. B. Eddy Co., Dryden Paper Co., J. C. Wilson, Ltd., Canada Paper Co., Dominion Paper Co., Brompton Pulp and Paper Co., and Lincoln Pulp and Paper Co.

R. S. Dunlop recently placed before the Board application of the Canadian Paper Box Manufacturers' Association for greater protection of their products. After presentation of the brief, application was laid over for a second hearing in order to consider the specific requests before further argument was heard.

Hon. W. D. Euler, Minister of National Revenue, and R. W. Breadner, Commissioner of Customs, Ottawa, were recently waited upon by a deputation representing manufacturers of tissue papers, paperboard, fine papers, coated paper and waxed paper converters, who petitioned the minister for the appointment of an expert paper appraiser as member of the staff of customs division to pass upon importations of paper and paper commodities, to prevent misclassification and under-valuation of such imports.

Technical Section Program

All arrangements have been made for the Summer Technical Section meeting of the Canadian Pulp and Paper Association from June 20th to 25th. Members in this trip will assemble at the Chateau Frontenac, Quebec, where the secretary will have his headquarters, on June 20th, in time to take the train for Saguenay Power Junction, where they will arrive on June 21st.

June 21-22 will be spent at Kenogami, River Bend and Grande Decharge, at Price Bros., and Co. Thursday will be spent at Port Alfred as guests of the Port Alfred Pulp and Paper Corp. On June 24th, they will return from Chicoutimi to Quebec by boat, arriving at Quebec to connect with trains for Montreal.

Few, if any, other locations provide so much of interest to the technical man and operating executive as that chosen for this year's meeting. The Port Alfred mill has a type of paper machine drive not in use anywhere else, and is opera-

These Representative Jobs are the Result of our Efforts to Improve

CONVEYING *and* ELEVATING MACHINERY *in* PAPER MILLS

Operating men are demanding from manufacturers of conveying and elevating machinery a decided improvement in this class of equipment as used by the paper mills.

The jobs listed below were sold, without exception, on the strength of their engineering features, and in the placing of these contracts the decisions were made by men of thorough experience in the operating end:

MANITOBA PAPER CO., LTD., Pine Falls, Manitoba.	Cable Conveyors, Chain Conveyors, Belt Conveyors, Bucket Elevators, 125 ft. Pulpwood Stacker.
STE. ANNE PAPER CO., LTD., Beaupre, Que.	Cable Conveyors, Chain Conveyors, Belt Conveyors, Bucket Elevators, 125 ft. Pulpwood Stacker.
THE SPANISH RIVER PULP & PAPER MILLS, Espanola, Ont.	Cable Conveyors, 120 ft. Pulpwood Stacker.
ABITIBI FIBRE CO., LTD., Smooth Rock Falls, Ont.	125 ft. Pulpwood Stacker.
DONOHUE BROS., LTD., Lamalbaie, Que.	Chain Conveyors, Cable Conveyors.
PORT ALFRED PULP & PAPER CORP., Port Alfred, Que.	Cable Conveyors.
FORT WILLIAM PAPER CO., LTD., Fort William, Ont.	Chain Conveyors, Belt Conveyors, Bucket Elevators, Complete Coal-handling Plant.

Our equipment speaks for itself. We ask that prospective buyers of conveying and elevating machinery give us an opportunity to show what we have accomplished.

WEBSTER-INGLIS LIMITED

ENGINEERS AND MANUFACTURERS OF

Conveying and Elevating Equipment of every description.

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ting two of the most recent types of continuous pulpwood grinder, besides having other features. The Price mill at Kenogami will then have in operation the latest development in paper machine driers, the Minton vacuum drier. At River Bend, Price Bros. have one of the best arranged newsprint mills to be found anywhere, and just near by is the Duke-Price Power Co.'s development that has attracted world-wide attention.

An order-in-council has been signed by the Governor-General approving arrangements made by the Department of the Interior for transferring three divisions of the Forest Products Laboratories from Montreal to Ottawa. This means that the timber physics, timber mechanics and wood preservation divisions will now operate in Ottawa, while the pulp and paper division will remain in Montreal.

QUEBEC

Brompton Dispute Settled

The board of conciliation and investigation, composed of W. A. Dowler, K. C., chairman; Col. Emile Rioux, K. C., and J. T. Foster, appointed to investigate the complaint of several employees that they had been dismissed by the Brompton Pulp and Paper Co., because they were members of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, came to an abrupt ending. The complainants were heard, and the board was ready to hear the company's witnesses, when an agreement was reached between the parties interested.

The employees agree that no propaganda favoring the International Brotherhood or any other union shall be carried on in the buildings or property of the company, and the company agrees that there will be no discrimination in employment between union and non-union employees. The company further agrees to reinstate "as nearly as possible as before" all employees laid off since the first of the year. Five hundred employees were indirectly interested.

Fire recently destroyed the warehouses, with their contents, of the Canadian International Paper and J. R. Booth companies at Kipawa. The steamer Silverland, which was docked near the warehouses, was also burned. Three members of the steamer's crew had a narrow escape from the steamer. Damage to the Silverland is estimated at $40,000, with about $35,000 damage to the warehouses.

Quebec Pulp and Paper Plans News Mill

At the annual meeting of the Quebec Pulp and Paper Mills, Ltd., the president reported that the company no longer rely on a permanent or stable market for its mechanical pulp. Consequently, the Provincial Government has been approached with a view to obtaining additional timber limits to permit the company to carry through its plans for erecting a paper mill. He added that the Quebec Government, aware of the needs of the company for additional limits, would likely consider the case of the shareholders favorably in the near future.

The company recently sold its interest in the Roberval-Saguenay Railway and the Chicoutimi Port Co. to the Aluminium Co. of Canada for a net price of $1,587,000 cash, and the proceeds of this sale have been kept intact.

The new St. Anne Paper Co. mills at Beaupré will be ready to start before the end of the month, according to plans the stage reached in the construction work, directed by the W. I. Bishop Co., Montreal. It is expected one of the machines will be ready by the 15th of June and that manufacture of newsprint will be started. The newsprint will be shipped mostly to the United States. When in full operation, over 250 tons of paper will be produced.

T. L. Dunbar, one of the officers of the Stebbins Engineering and Mfg. Co., as well as the recently organized Chemi-Pulp Co., of Watertown, N. Y., will have charge of the Montreal office of the Stebbins company. He has been connected with the Stebbins company for the past eight years.

The capactiy of the new newsprint machine of the Brompton Pulp and Paper Co., Bromptonville, has been increasing for the past few weeks and the machine is now turning out over 105 tons daily. It is expected to eventually be around 130 tons.

Development in the forestry research service of the Provincial Department of Lands and Forests are planned on a large scale, and a new branch in which the public can receive instruction in botany and like matters is to be instituted soon. The department has had a research service for some years, but an endeavor is being made to considerably augment the work.

The largest building permit to be issued so far this year at the Quebec City Hall was recently taken out by the Anglo-Canadian Pulp and Paper Mills, which calls for the expenditure of $2,000,000 on the company's new mill under construction at Limoilon. G. F. Hardy, of New York, is construction engineer and William I. Bishop Co., of Montreal are contractors. The main building of the mill will be 880 feet long and taper from 290 to 232 feet in width. The main buildings will be two stories in height, and there will be a 125-foot tower.

Canipco News

G. Gordon Gale, general manager of Gatineau Power Co., has been elected a vice-president of that company.

During the summer the federal government will deepen the channel in the Ottawa River at the docks of the Gatineau mill, for transportation of raw materials and shipment of paper from the mill. Randolph MacDonald Co., of Toronto, Ont., got the $40,000 contract.

Most of the village of Lac Ste. Marie will be under water when the dam in construction at Paugan Falls, on the Gatineau River, has been completed. The Gatineau Power Co. has agreed to move several buildings in the village to new sites about half a mile distant. Arrangements are also being made for disinterring the present cemetery which will also be flooded. The company will indemnify the church to the extent of $20,000 and construct some ten miles of road. The dam will bring the village of Kazubazua, to the shore of the lake which will be formed by the holding back of the water.

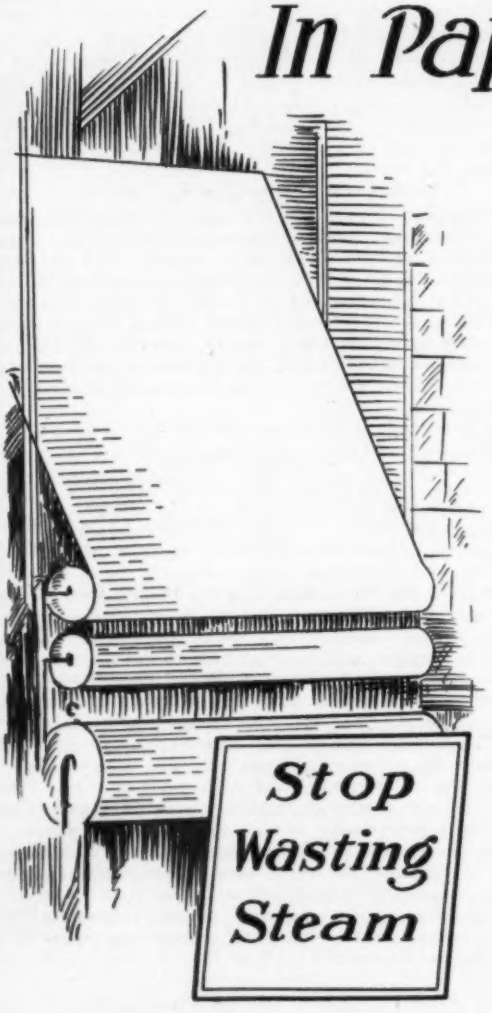
The Canadian Pacific liner "Montreal," en route from Montreal to England, docked at the Canipco wharf and took on a big shipment of newsprint for the English market. Some 500 tons of paper put on and the vessel left the following day. At the same time the "Phillip T. Dodge" sailed for England, carrying a shipment of paper for the use of the London papers.

Keith Morris, in Quebec, to write special stories for the London Financial Times, confirmed previous reports that English financiers were to back a huge project in the Lake St. John district and, in fact, that three of the representatives of the interests referred to were to be here some time this month. Regarding the report that $500,000,000 would be expended in the Lake St. John district by those interests, Mr. Morris thought there had been a misunderstanding. What had been said was that the financial interests referred to represented that amount. At the beginning several million dollars would be spent by the capitalists, but no figure had been officially mentioned.

E. B. Wardle, chief engineer of the Laurentide Co., Grand 'Mere, returned from a trip around the world, and his many friends will be pleased to learn his health is much improved.

Construction work is coming along nicely with the Lake St. John Power and Paper Co. W. I. Bishop Co. has nearly completed the driving of piles for the mill, and the Foundation Co. is working on the bridge for the extension of the Canadian

Where Do Profits Come From In Paper Making?



With steadily rising production costs and fluctuating market prices, the mill that secures its fair margin of profit is the mill that cuts corners by trimming its operating costs.

The Briner Economizer

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has been adopted by most prominent mills as the logical method of reclaiming needed heat from the waste vapor. The saving of steam thus effected lops a substantial amount from the cost columns, thereby affording greater leeway for selling margin and retaining profit.

Have you investigated the advantages held by the mill that operates Briner Economizers.

Our engineers will tell you what results you can expect in your mill.

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ROSS ENGINEERING OF CANADA, Limited
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ROSS SYSTEMS
HEATING—VENTILATING—DRYING

National Railway from St. Félicien to Dolbeau. The Canadian General Electric Co. was given the contract for the sectional electric drives now being constructed by the Dominion Engineering Works.

W. L. Crombie, general manager of the Budge Carbon Paper Mfg. Co., Montreal, left for a tour of inspection of the European branches of the company, situated in England, Ireland, Scotland, Norway, Sweden, Switzerland, Italy, Germany, Czecho-Slovakia, France and Belgium.

According to Mr. Fauré, of the Anticosti Corp., work on the new docks and pulpwood loading facilities at Anticosti, is being completed preliminarily to the big pulpwood transportation programme that the company has planned.

Ogden Minton, who successfully applied the principle of the vacuum drier to the evaporation of moisture on the paper machine, was in Montreal recently, on his way to Kenogami, where one of his driers is now in operation in the Price Bros. mill. He sailed for Europe on June 8th, where he will visit England, Sweden, Germany and France in the interests of the Minton Vacuum Dryer Co.

Two flying boats of the Fairchild's Aerial Surveys, left their base at Lac à la Tortue, for Burbridge, their base during the open water season. Their duties will be fire detection and suppression over the Gatineau timber limits of Canadian International Paper.

ONTARIO

Plant of Canadian Cellulose Company

In a "Special Canadian Number" of Chemistry and Industry, the journal of the Society of Chemical Industry, Prof. L. F. Goodwin gives an interesting account of the construction and operation of the new plant of the Canadian Cellulose Company at Cornwall, Ont. Designed, erected, and now being put into operation by G. H. Tomlinson, all within a year, it is a model of design. It is intended to demonstrate that with modern methods and equipment soda pulp can be made so as to compete with sulphite. And since scientific method is lacking in many sulphite mills success will lie with the chemical engineer.

Two digesters of 50 tons daily capacity are installed and equipped with external heating by the Morterud system. A special feature here and elsewhere is the use of hydraulically-operated valves. Oliver filters are used to separate the black liquor for the pulp, which is then again diluted and carried to a special set of screens, consisting of a drum rotating within an octagonal chamber, this combination imparting a peculiar pulsating motion to the stock. There are the usual additional screens and devices for rejects during the chipping, washing and screening operations.

Bleaching is carried out in three vats lined with white tile, provided with screw conveyors for the pulp and with ingeniously controlled valves. An electrolytic soda and chlorine plant is installed, but with the anticipated efficiency in soda recovery in the calciners, little make up soda should be required. A new type of dryer is in use, designed to economize in steam consumption. This effected by subjecting the pulp web to pressure between heavy corrugated rolls, squeezing out as much water as possible before passing it on to the drying rolls. All pulp produced in the digesters is thus treated irrespective of its subsequent destination, thereby effecting great economy of labor and handling throughout the plant.

The soda recovery system is of the modern type, with many improvements. The black liquor and washings, part of which circulate in the causticizing cycle, are taken to quadruple effect evaporators and evaporated to the utmost practical consistency. The concentrated black liquor is then sprayed into a modern type of calcining furnace, where it is burnt and the molten soda ash tapped off at the bottom and sent to the green liquor tanks. The waste heat gases go through a tunnel where they impart a final concentration to the incoming black liquor, and pass on to two waste heat boilers, and then through a scrubber into the atmosphere. In efficient mills, the heat thus generated more than suffices to run all operations. A large rotary kiln is used to burn the calcium carbonate sludge. The green liquor is causticized by means of lime in a continuous and automatic fashion, the white liquor and sludge passing through two Dorr thickeners, and then through special tanks where its specific gravity, head, and quantity are automatically controlled. Oliver filters handle the calcium carbonate sludge. The plant sprang, like Minerva, finished from the head of its designer, necessitating no changes of plan, and resulting in great economy of space and erection costs. It is to be hoped that the Howard Smith Paper Company will continue to avail themselves of research in the running of this mill.

International Expands in Ontario

Shortly after Hon. G. H. Ferguson had served notice on E. W. Backus that he must begin work at once on proposed mill or forfeit his lease of valuable pulpwood limits, announcement was made that A. R. Graustein, president of International Paper, had acquired from Geo. M. Seaman and L. L. Alsted a 60 per cent interest in the company, the remaining 40 per cent of which belongs to Mr. Backus. Disputes had arisen between Messrs. Backus and Alsted regarding the control of the company, but it is now asserted that construction will go ahead.

Premier Ferguson has stated that the new agreements with the company over the timber limits would have to include a complete revision of prices, conditions and terms. The operation and erection of mills will be entirely changed under the new agreement, and the higher prices now current for pulpwood must be met.

Completion of Provincial Paper Acquisition Delayed

On the application of Walter E. Booth and other shareholders of the Provincial Paper Mills, Ltd., Justice Middleton, of Toronto, has granted an interim injunction restraining the Provincial Paper Mills, Limited, Dominion Securities Corp., I. H. Weldon, T. A. Weldon, S. F. Duncan, Alex. Fasken and R. S. Waldie, all of Toronto, from transferring or in any way dealing with 100,000 shares of the newly incorporated Provincial Paper, Ltd. Justice Middleton also ordered that in case these shares had been hypothecated at the time of the hearing of the motion, together with other securities received from the company, proceeds of all other securities received from the new company should be applied in exoneration of the charge upon the 100,000 shares. It was provided, however, that both injunctions would be dissolved if at any time the defendants transferred to the accountant of the Supreme Court 5,000 shares to answer the claim of the plaintiffs.

New Canadian Manufacturing Plant

A complete manufacturing plant is to be placed in operation June 1, by the Stephens-Adamson Mfg. Co., at Belleville, Ontario. From this factory the entire S-A conveying machinery line will be supplied to the Canadian trade.

G. A. Freeman, for fifteen years associated with the main organization in an executive capacity at Aurora, Ill., will be in charge of the new plant.

Backus To Furnish Power

An agreement has been completed between Hon. William Finlayson, Minister of Lands and Forests for Ontario, and E. W. Backus by which the latter is to supply municipalities designated by the Government, mining corporations, and other industries, at the rate of $14 per h.p. from his Seine River development.

The Seine River rights were granted to Backus by the Drury Government, when Hon. Beniah Bowman was Minister of Lands and Forests, but with the change in Government the Ferguson administration refused to issue the leases on the ground that it was not in the public interest. In the

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER CHIP SCREEN

GRADES CHIPS
ACCURATELY AND ECONOMICALLY

CAPACITY — 15 CORDS PER HOUR

POWER — 2 HORSE POWER

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
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meantime, however, Backus had spent considerable money on the development; and in view of his investment it was decided to grant the lease, with the proviso that power be supplied to other concerns, as directed by the Government.

Backus Sues Over Water Supply

For several days an interesting law suit proceeded in Toronto in an action instituted by the Keewatin Power Co., against the Lake of the Woods Milling Co., and the Keewatin Flour Mills, official figures and much data in regard to the Keewatin water supply being presented. The Keewatin Power Co. of which E. W. Backus, the well known paper manufacturer, is president, seeks an injunction restraining the defendants from diverting water through their plants and premises for power purposes, claiming such diversions, cause serious restriction of the power operations of the Keewatin Power Co at the Norman dam.

T. J. Mansell, of the Howard Smith Paper Mills', Toronto office, left for England on a three months' trip. Mr. Mansell, hale and hearty at 80, came to this country some fifty-six years ago, and has not visited his home country for over fifty years.

Dominion Envelope Expanding

The Dominion Envelope and Carton Co., Toronto, has installed an embossing and color press for the coloring of paper used in paper boxes, wrappings, etc., as well as kraft. This is the second press of the kind which the company has now in service.

The company is also interested in the Canadian Seaman Containers Co., Toronto, just starting up and turning out a line of containers such as lard pails, barrels, etc., made from waste paper products, to take the place of wooden containers. The Dominion Envelope Co. will handle the output of the new firm in Canada.

The new strawboard mill of the Hinde and Dauch Paper Co. at Trenton, which has been completed, started up last month, and will have an output of 50 tons a day.

A charter has been granted to the Caledonian Hardwood Production Co., Ltd., undertaking great woodworking developments in Northern Ontario, in the vicinity of Blind River. The authorized capital is $5,000,000 and the head office will be located in Blind River. The company is to carry on lumbering and the lumber trade in all its branches, as well as buy, sell, make and deal in pulp, pulpwood, paper and other products.

The Interlake Tissue Mills, Merritton, has solved the water problem by entering into a new agreement with the town and installing its own filtration plant, assuring an abundance of pure water. Some of the other mills in the Niagara district anticipate trouble in the matter of pure water supply when dredging operations on the Welland canal are resumed.

A 40,000 acre tract of land, near Bancroft and Peterboro, taken over by the Ontario Hydro-Electric Power Commission in 1916, with the central hydro system, was to be sold by tender on June 1st. The tract will likely pass into private hands as the Government, it is stated, has no intention of taking it over as a reforestation area or game preserve.

A federal charter was recently issued to W. J. Bell Paper Co., Ltd., with authorized capital of $100,000 and headquarters in Toronto.

The Temiskaming and Northern Ontario Railway will build a branch line west from the present end of the road at Pine Stump, towards Smoky Falls. This branch will serve primarily the china clay field, news of interest to the paper industry in general, particularly those making coated papers, but there are other minerals in that area which the

The above shows Bristol's Recording Thermometers and Pressure Gauges in connection with Sulphite Digesters.

Accurate -:- Continuous

RECORDS

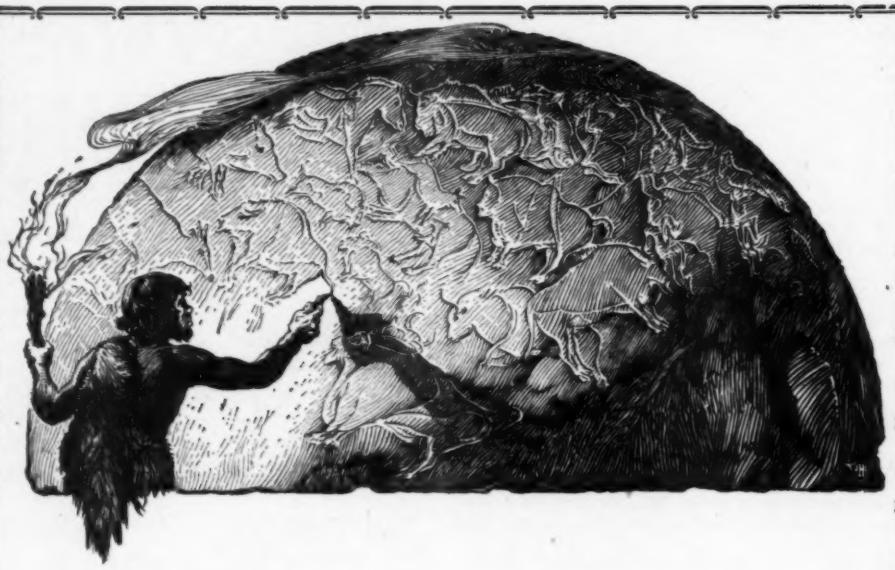
The Greatest single force you can employ for successfully directing the progress of temperature and pressure during the cook in digester operation.

BRISTOL'S

Recording Thermometers and Pressure Gauges furnish continuous chart records, which show the operator just how the cook is progressing. Guided by such records it's easy to produce thoroughly-cooked pulp—*on Scheduled Time.* This means a greater output per unit, and a consistently high standard product.

The Bristol Company *Waterbury, Connecticut*

BRISTOL'S RECORDING INSTRUMENTS



The Artist Had No Paper

CONFUCIUS is credited with the sentiment: "Give me one picture, and I will save a thousand words." A thousand words on the typewriter is a few minutes' work. In Chinese characters they call for a considerable physical effort.

Had the Altamira Cave Man, thousands of years ago, used a written language to describe a buffalo, we would probably be unable to decipher what it was all about. We do understand his picture very readily.

Hundreds of generations ago the Cave Man published his picture of a Paleolithic buffalo. In this long interval of time only a few persons have seen the original drawing. Thousands of pairs of eyes will see the representation in printer's ink at the top of this page.

The modern illustrator can get his picture message to thousands — even millions — quickly. He has paper at his command.

Hammermill Paper Company

Erie, Pennsylvania

Government believes will show profitable development. The new line may connect up in the long run with Smoky Falls, where the Spruce Falls Co., is developing an important power site, where they have already built a 50-mile line from Kapuskasing.

The Hataninda Forest Products Co. already doing some sawing and lath manufacturing at Blind River, was granted an Ontario charter with an authorized capital of $3,000,000 and headquarters in Blind River. The company is authorized to engage in general lumber and woodworking business, and to manufacture and deal in pulp, pulpwood, paper and other products.

Canada Paper Co., with warehouse for many years at 290 Bay St., Toronto, has moved to Minister-Myles Building, Pearl and Simcoe Streets, with much larger and well located quarters.

H. F. McLean, Ltd., of Montreal, were awarded contract for the 100-mile extension of the Temiskaming and Northern Ontario Railway north from the present end of steel to Coral Falls on the Abitibi River. The work is to be completed by December 15th next. The new extension will tap several tracts of spruce and other species of pulpwood.

The new machine recently installed at the mill of the Fort Frances Pulp and Paper Co., at Fort Frances, is one of the largest paper machines in the world, being exceeded in width only by the four machines installed at the Gatineau mill of Canadian International Paper.

A. G. Durgin, professor of chemistry for the past ten years with the Spanish River Pulp and Paper Mills, at Sault Ste. Marie, has resigned to join the technical staff of the Canadian Bank of Commerce.

Burl Branch, well known in Canadian and American Papermakers' circles, severed relations with the Canadian Barking Drum Co. after having been with them for seven and a half years. Since then he has been connected with the Link-Belt Co., representing them in the pulp and paper field in Canada. Mr. Branch, intimately connected with the development and sale of barking drum for seventeen years, is now applying his knowledge and experience in the manufacture of a drum of his own design.

The current year's operations of the Cosmos Imperial Mills, Ltd., shows splendid progress, one reason being the rapid development of the newsprint industry in the Dominion. The Cosmos Mills supply a large demand for cotton drier felts for newsprint machines, ranging in price from about $1500 to $2000 each, and lasting an average of 30 to 40 days.

The most satisfactory adjustments in wages and working conditions made by the unions associated with the paper making industry in the United States and Canada, from the standpoint of the paper makers' union, has been the one made with the Kenora Paper Co. Under the provisions of the adjustment, third hands will receive an increase of 10 cents an hour, beater engineers an increase of 7 cents an hour, while a 12-cent increase has been given for miscellaneous positions.

Thorold Filter-Plant Dispute Settled

Paper manufacturers in the Niagara Peninsula, depending upon Thorold for a pure water supply for their mills, were interested in the announcement that settlement of the Thorold water-works dispute had been reached, after Mr. Justice Logie adjourned court for a discussion between the disputing parties as to a basis on arbitration could be reached.

Counsel for Jas. F. Wilson, who appeared as plaintiff on behalf of Thorold's ratepayers, agreed to the rescinding of the previous purchase and retaining by the town of Thorold of part of the property for $10,000, William and Hugh T.

RODNEY HUNT

Water TURBINES

and

Water Power Equipment

for

Paper Mill Drives

and

Hydro-Electric Service

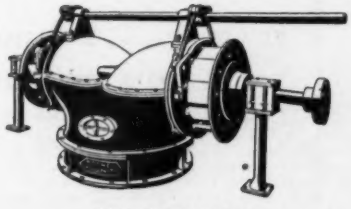
Over 50 Years Experience

and thousands of installations warrant your investigation

New Mill Type Turbines

Horizontal and Vertical Replacements a Specialty

Modernize Your Water Power with New Rodney Hunt Equipment



Write for Catalogue

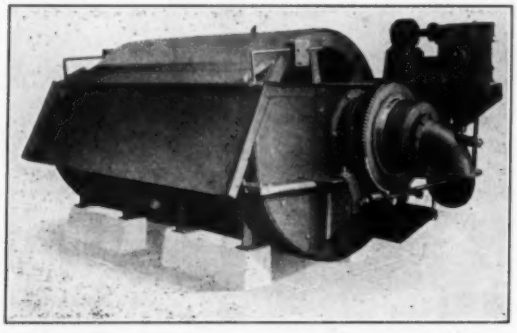
Rodney Hunt Machine Co.

38 River Street, Orange, Mass.

RODNEY HUNT

Our Experience of More Than 50 Years Is of Value to You

$250 per day
is the nice little gift
OLIVER SAVE-ALLS
are giving one Paper Company in the Pacific North-West



Ten tons of stock which daily "went down the creek" is now being turned into money since they installed

OLIVER'S
to handle the White Water.

If you have a Paper Mill your White Water will make you a daily present if you put an OLIVER to work. Olivers do other things in Paper Mills as well.

See page 381 in the 1926 Paper and Pulp Mill Catalogue.

Oliver Continuous Filter Co.

San Francisco
802 Cunard Building

Oakland, Calif.
4th & Madison Sts.

New York
1547 Aeolian Building

Johannesburg, South Africa
E. L. Bateman, The Corner House

London
11 Southampton Row

Honolulu, T. H.
W. A. Ramsay, Ltd.

Munro agreeing to refund $15,000 of the $25,000 already paid them. Plaintiff withdrew unreservedly all charges of corrupt or fraudulent dealings in connection with the purchase.

The Harland Engineering Co. of Canada has been given the contract for the sectional electric drives for the four 234-inch Dominion Engineering paper machines to be installed in the Spruce Falls Power and Paper Co. newsprint mill now under construction at Kapuskasing. The speed range is 660 to 1400 ft. per minute. The D. C. generator will be driven by a steam turbine.

Abitibi Jottings

Conferences extending over several days between the various unions and the company, brought agreements in force last year extended over for one year.

Jos. Lafrainier, for several years district logging superintendent, was appointed superintendent of construction and improvement; and Nicholas Paul, who, for several years, was assistant district logging superintendent, has been made district logging superintendent and in charge of the Abitibi River district.

The month of April was the best month from a production point of view that the Iroquois Falls newsprint mill has yet had. The average daily production over the month was 541.5 tons, being more than six tons better than the best previous record.

Michael Duffy left Iroquois Falls to take up a position at the Gatineau mill of Canadian International Paper.

The sulphite mill took advantage of the high water to clean out the acid vats over a week-end towards the middle of last month. In high water the discharge into the river has the least injurious effect on fish life.

Edgar A. Columbus has been appointed assistant foreman of the machine shop, succeeding A. E. Morley who left recently for Kapuskasing.

Col. Mills, for some time purchasing agent for the Abitibi Fibre Co., which was recently removed from Toronto to Smooth Rock Falls, has resigned.

Owing to recent flood conditions in the Winnipeg River, the Kenora Paper Mills had to shut down nine out of ten lines of grinders, causing a severe drain on the storage supplies. As a result, the company was compelled to purchase pulp in an attempt to keep up newsprint production. The serious aspect was greatly increased through the rise of water in the Rainy River, which forced a shut-down of the company's grinders at the mills in Fort Frances and International Falls, Minn.

Robert Stocks, lately associated with H. F. Brunton representing Canadian International Paper Co. in Toronto and vicinity, has been moved to Brockville, where he will make his headquarters.

The Lincoln Pulp and Paper Co. of Merritton, cut in their new filtration plant last month, assuring a steady supply of pure water for paper making purposes.

The Temiskaming and Northern Ontario Railway, under the name of the Nipissing Central, will penetrate into the northwestern gold fields of Quebec Province. One of the important provisions is that the railway must compensate limit holders. The new line will cut through several timber limits, including those of the Canadian International Paper Co. and the J. R. Booth Co., who will be compensated for their land as well as timber.

St. Lawrence Pulp and Lumber to be Reorganized

It is stated that steps have been taken to place the St. Lawrence Pulp and Lumber Co. in the hands of a receiver. This is not to be interpreted, however, that plans for a reorganization of the company by a Montreal financial house, and an issue of bonds to provide new capital will be terminated.

Up to the present the company was being operated by

Felts easily cleaned with OAKITE!

IT is the experience of many mills that when Oakite is used for washing felts, either on or off the machine, that washing is accomplished more quickly, thoroughly, and better than with other materials previously used. Fibres of the felt are not weakened by Oakite. Another advantage is that this remarkable material rinses easily and completely. Felts last longer.

Whether for washing felts; cleaning Fourdrinier wires; removing dirt, oil and tar from cylinders; cleaning dandy rolls, screen plates, pipes and mixers, Oakite does the job efficiently and at low cost.

Write us for further details; or ask for Oakite Service Man near you to call. No obligation.

OAKITE IS MANUFACTURED ONLY BY
OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK
(Formerly OAKLEY CHEMICAL CO.)

Oakite Service Men, cleaning specialists, are located at

Albany, Allentown, Pa., Altoona, Pa., *Atlanta, Ga., Baltimore, *Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, Buffalo, Camden, Charlotte, N. C., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, Decatur, Ill., *Denver, *Des Moines, *Detroit, Erie, Pa., Flint, Mich., Fresno, Cal., *Grand Rapids, Harrisburg, Hartford, *Indianapolis, *Jacksonville, Fla., *Kansas City, *Los Angeles, Louisville, Ky., *Memphis, Tenn., *Milwaukee, *Minneapolis, *Montreal, Newark, Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., *Omaha, Neb., *Philadelphia, *Pittsburgh, Portland, Me., *Portland, Ore., Providence, Reading, *Rochester, Rockford, Rock Island, *San Francisco, *Seattle, *St. Louis, South Bend, Ind., Syracuse, *Toledo, *Toronto, *Tulsa, Okla., Utica, *Vancouver, B. C., Williamsport, Pa., Worcester.

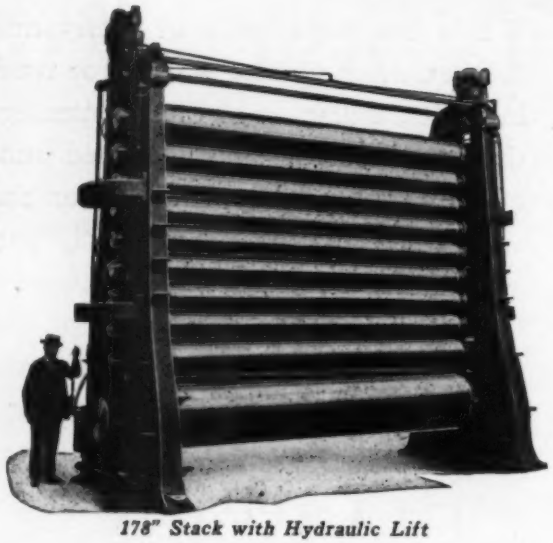
*Stocks of Oakite materials are carried in these cities.

OAKITE

TRADE MARK REG. U.S. PAT. OFF.

Industrial Cleaning Materials and Methods

FARREL



178" Stack with Hydraulic Lift

FARREL CALENDERS
AND
FARREL ROLLS

are made in all sizes
up to and including

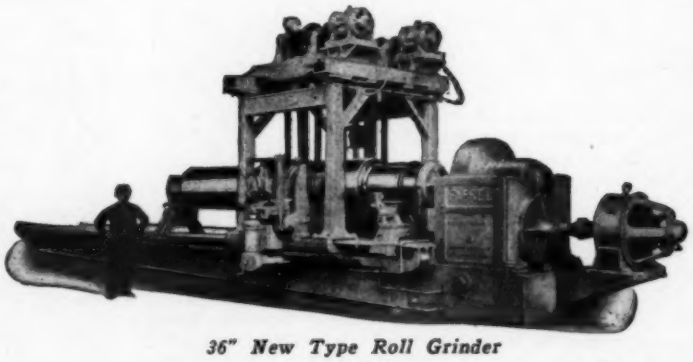
264" ON THE FACE

Calenders are made with HYDRAULIC, ELECTRIC OR RATCHET LIFT, all operated from the floor.

MACHINERY BUILDERS SINCE 1848

FARREL NEW TYPE ROLL GRINDER

is built in 24", 32", 36" and 42" sizes, all electrically driven throughout, lubricated automatically and fitted with geared head, new crowning device and other improvements.



36" New Type Roll Grinder

FARREL FOUNDRY and MACHINE CO.

Established 1848

ANSONIA, CONN.

Branch Plant: BUFFALO, N. Y.

a bondholders' committee, and an offer was submitted to the holders of the bonds and accepted, by which they receive new common stock in exchange for the bonds. This leaves the way clear for the formation of a new company and an offering of first mortgage bonds by the new interests. The liquidation proceedings make it somewhat uncertain as to when the reorganization will actually take place; but the plans for this are ready and await only the proper legal conditions.

MANITOBA

International in Manitoba

It is reported that the Forestry Branch of the Interior Department, at Ottawa, has been advised unofficially by International Paper that investigations are to be made this summer into the Nelson River pulpwood berth, with the object of bringing on development within the next eighteen months. The company has not yet made formal application for the berth. The latter contains some 12,000,000 cords of pulpwood, and the development would cost about $15,000,000.

The White Mud Falls, greatest water-power site in Canada, excepting Niagara Falls, will be developed along with the pulp mill which would be located some distance to the south of the falls, on one of the little lakes which are tributary to the Nelson River.

BRITISH COLUMBIA

Western Canada Pulp Mill Sold

After some months of negotiations, one of the most complicated deals in connection with the assets of the defunct Home Bank of Canada has been consummated by the sale of the mill of the Western Canada Pulp and Paper Co., at Howe Sound, and an extensive area of timber limits, consisting of about 19,000 acres at Port McNeil, on Vancouver Island.

The sale price, $450,000, for these two properties is regarded by the inspectors representing the depositors and creditors as one of the most successful sales of the late bank's assets. Like other properties carried on the books of the bank, the value was regarded as excessive at $2,000,000. The liquidators stated that the pulp mill was disposed of for $100,000 and the timber limits for $350,000 to Everly M. Davis, of New York City. It is understood that the plant at Port Mellon will be operated under the name of the Davis Pulp Co., Ltd.

NEW BRUNSWICK

International Opens Office

An office of International Paper has been opened in Fredericton as the headquarters for the eastern division of the forestry branch. The building was formerly the late Hon. A. G. Blair's residence.

A staff of forestry engineers has been established with F. J. Farrell in charge who was transferred to Fredericton from Wynn, Me. Mr. Farrell stated that the office will be the headquarters from which forest surveys undertaken by the company in New Brunswick will be operated.

A fixed stumpage rate for not less than five years, extension of present leases from 40 to 50 years, a revised scale to meet existing conditions, the keeping of the annual cut within the estimated or ascertained growth, and improved protection of the forest from fire, are the principal recommendations regarding the management of Crown Lands in order to stabilize the lumber industry in New Brunswick. These recommendations were made by the Royal Commission who have been investigating the industry during the past months.

ROOTS

BLOWERS
for CONVEYING

Roots Blowers are ideal for pneumatic conveying of rags, wood chips, or any loose material.

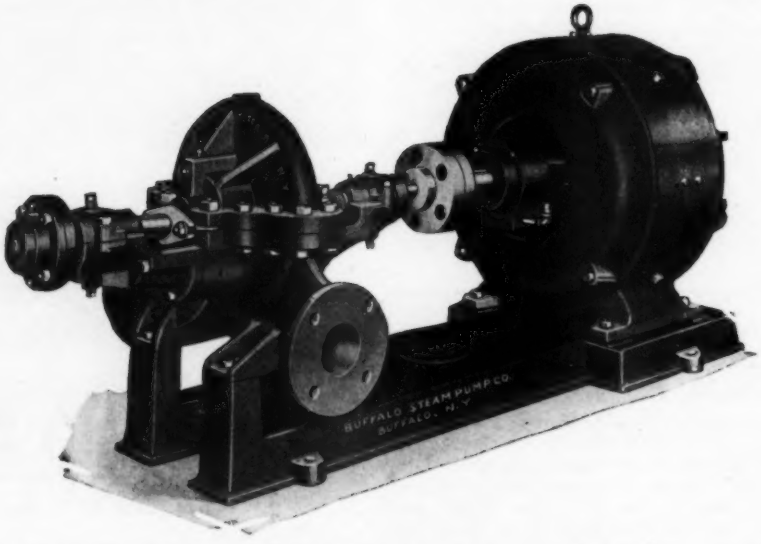
There are many installations that are giving uninterrupted service at surprisingly low cost for power and for maintenance.

Ask us for complete information

"Standard Since 1859"

The P.H.&F.M.ROOTS CO.
DEPT. 10
CONNERSVILLE, IND.
Chicago Office 130 S. Michigan Ave.
New York Office Room 800-120 Liberty St.

A remarkable pump for boiler feeding—



For power plants with boiler pressures up to 200 lbs., this new Buffalo Single Stage Centrifugal Pump is ideal.

It costs considerably less than a steam or multistage centrifugal pump of the same capacity. It takes up little space. Designed for motor or turbine drive, it runs up to 3600 R.P.M., smoothly, silently, and continuously. Exceptionally high efficiency is obtained against the higher pressures, where heretofore common practice has been to use multistage pumps.

Double suction construction gives perfect hydraulic balance at all times, under any conditions, eliminating thrust troubles.

If you are interested in the complete description of this pump, just drop us a line on your letterhead.

Buffalo Steam Pump Co.

213 Mortimer St. Buffalo, N. Y.

In Canada—Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" Class "SF" Boiler Feeders

BRITISH CORRESPONDENCE

Trade Conditions.

Conditions in the British paper industry at present vary considerably. Market prices are steady, and the demands for raw material are favorable. The larger newsprint mills are fairly well booked up with orders from both home and overseas buyers, but some of the smaller mills are not doing so well. There is a general anxiety in this section at the growing trade between Australia and Canada; and hopes are entertained that the fact that Great Britain is the best buyer of Australian goods may act as an influential factor in their favor and cause Australia to act in a reciprocal manner by placing some of her orders for paper with this country.

Mills in the woodfree section are both busy and slack, according to circumstances. Prices are steady, but foreign competition is severe, but the fact that British mills can offer a quicker and more efficient delivery service than the Continental producers acts to some considerable extent in their favor.

Most of the Esparto orders come from the home market, and printers are still showing a steady preference for Esparto papers which ensures a steady flow of trade. Prices in the fine paper section have not changed for several years. Australian and New Zealand markets are the mainstays for exports, but efforts are being made to increase the sales of this class of papers in South America.

Wrapping mills are continuing to benefit under the tariff measures instituted a year ago, but the hand-made section is suffering from the increased purchase of machine made papers, and the number of mills engaged on this work has dwindled considerably; indeed, there are none at all in existence in Wales, Scotland, and Ireland.

The British paper merchants are not in such a happy position as the manufacturers. This is largely owing to the development of the trust movement, and to the growing practice of manufacturers dealing direct with consumers, and merchants now find themselves actually competing with the mills from which they purchase. In order to take some counteracting action against this, some of the merchants have secured control of certain mills. It is considered by leaders in the grade that the growth of combines and trusts points to the fact that the days of the small mill are drawing to a close. The big concerns appear to be establishing new methods of distributing and selling paper, and if they brand and advertise their papers, their position will be considerably strengthened, and much economy will result.

Returning to the wrapping paper duty, it appears that this is being felt more keenly by the wrapping paper mills than they at first anticipated. During the last three months, the imports of this class of paper have dropped 20,000 tons compared with last year's figures—from 65,000 to 45,000, which is almost 40 per cent. British paper mills manufacturing kraft have progressed much further than their Scandinavian, Finnish, and German competitors anticipated, and the imposition of 2d in the shilling tax has turned the scale in favor of the British article. It is reported that the best Continental mills intend to enter on a campaign of price cutting in order to try and get back some of their lost orders; but if the British mills decide to meet the competition by cutting their prices also, their foreign competitors will have a very poor outlook.

More scientific methods of production are being applied by the British mills with a view to trying to increase their profitable output, and to reduce costs of production, and it is generally agreed that in general quality and output they have vastly improved since the war; but their warehousing and packing methods still leave much to be desired.

Developments in Bamboo Papermaking.

Further developments are being made in research work to prove the qualities of bamboo for paper making purposes. In a recent issue of *The Pioneer*, W. Raitt F. C. S. of the Government of India Forestry Department states:

"Apprehension has sometimes been expressed as to whether

RYERSON

Immediate Shipment from Stock

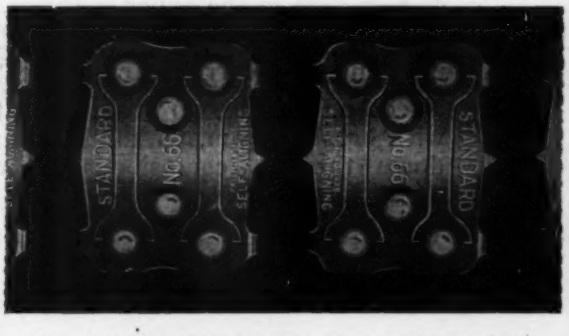
Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

STEEL



STANDARD SELF ALIGNING BELT FASTENERS

You can't go wrong on transmission or conveyor belts. Self Aligning hold the plate firm and square on the belt while rivets are being driven.

It is not necessary to use a rivet holder, nibs in the rivet hole align the rivet lengthwise of belt, the right way.

Self Aligning are rust proof and last indefinitely in wet or damp places, and you don't throw them away every time you take up a belt.

You need not turn your heavy wide belt over to clinch. Rivets may be clinched by driving against a block of metal on the under side of the belt.

Send for sample fastener for comparison with what you are now using. For 3 to 8 ply transmission to 3/8-in. thick conveyor belts.

THE BOURNE-FULLER COMPANY
UPSON WORKS
UNIONVILLE, CONN., U. S. A.

PROTECTION

Costs less than Paint

One coat of NITROSE surpasses the protecting qualities of two coats of paint and lasts far longer—saves labor and time.

No sand-blasting, no scraping, no paint removal—all NITROSE needs is wire brushing the loose scale.

NITROSE—the big favorite in Paper Mills

Every piece of metal in the vicinity of your sulphite plant is subject to the corrosive action of moist sulphur dioxide. Therefore, every piece of metal needs the protection of NITROSE—the standard preventive of corrosion in the paper industry.

NITROSE is the time, rust, acid, chemical, heat and cold resisting liquid armor that corrosion can not eat.

Needs no mixing, no priming coat. Covers wet, oily and hot surfaces, with brush or gun, without cracking, peeling or blistering. Goes right down through corrosion, and welds itself into a film of protection on all metal parts.

Write to the Peoria office for NITROSE prices and proof of NITROSE superiority.

Immediate shipment of cans and drums from

Rochester, New York
220 Mt. Hope Ave.
Lew Sales & Engr. Co.

Cleveland, Ohio
1367 E. Sixth St.
A. H. Young

San Francisco, Calif.
543 Clay St.
Day Sales Co.

Kansas City, Mo.
914 Central St.
Uhrich Supply Co.

New York City
723 Seventh Ave.
R. E. Hagenah

Los Angeles, Calif.
423 E. 12th St.
Enterprise Sales Agency

Detroit, Michigan
2051 W. LaFayette Blvd.
Coon-DeVisser Co.

Seattle, Washington
Alaska Bldg.
A. W. Peters

Peoria, Ill.
MAIN OFFICE
& FACTORY

Made Only by

The NITROSE Company

1500E, Peoria Life Bldg. **Peoria, Ill.**

NITROSE

bamboo is capable of supporting the drain upon it that would be created by the demands of a paper pulping industry whose eventual requirements might run into millions of tons, the world's present paper consumption being somewhere about fifteen millions. The case for bamboo cannot be visualized by its appearance as found in comparatively dry and hilly areas such as are familiar in the United provinces, and the absence of economical transport conditions would in any case render such unsuitable. To see bamboo in excelsis, we have to go to the moister regions where the areas and growth are not only immense and rampant, but where rain in the upper reaches of the rivers every month of the year keeps them in good transporting condition all the year round."

Paper Exhibition in Germany.

It is expected that several of the leading British manufacturers will be visiting the exhibition to be held at Dresden, Germany, which opened on June 1, and lasts until September. Each year an exhibition is held in Dresden devoted to one particular industry, and this year it is solely representative of "Paper: Its Production and Use."

The exhibition is divided into four sections: historical and statistical; production and machinery; practical application; and newspapers, periodicals, and books.

In Section 2, the actual making of paper will be shown from start to finish, and an exhibition journal will be printed on a rotary press, and the exhibition authorities are having a machine expressly built for this purpose.

Section 3 will show the various uses to which paper can be put. The last exhibition devoted to this particular trade was brought to a premature conclusion by the war.

PACIFIC COAST NEWS

Pacific Paper Trade Convention

Co-operation between paper manufacturers and merchants of the Pacific Coast was the keynote sounded at the tenth annual convention of the Pacific States Paper Trade Association, held at Del Monte, California, May 12-14. How to continue and foster the present splendid spirit of co-operation was the chief subject discussed at the meetings.

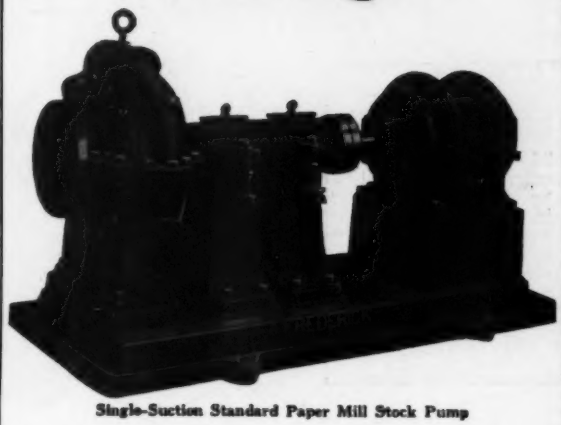
More than 150 delegates and guests attended the convention, which was the largest ever held by the organization. The guests were representatives of large eastern and western paper manufacturing concerns, and the delegates included paper merchants and jobbers from all the larger cities of California, Oregon and Washington.

The convention took note of the gradual westward trend of the pulp and paper manufacturing business. This move was welcomed by several of the speakers, who urged, however, that it should not be overdone. The delegates took a serious interest in sessions of the convention and apparently had gathered not primarily for recreation, but with an idea of sitting down together to work out mutual problems and, by exchanging ideas, to promote the interests of the industry. Committee meetings were fully attended and their reports showed that intensive work had been done.

M. R. Higgins, serving his fifth term as president of the association, was in the chair at all sessions. At the election, Mr. Higgins, who is chairman of the board of directors of the Zellerbach Paper Co., San Francisco, was chosen for a sixth term as head of the organization. In his annual report, President Higgins declared the co-operation now existing between the merchants and the mills made it possible to foresee a continuance of the present healthy conditions in the paper industry. Calling attention to the westward trend of the manufacturing branch of the paper business, he said that a large percentage of the world's future paper supply would come from the forests of the west and Alaska.

The association elected four new members, the Blake Moffitt and Towne companies of Oakland and Fresno, the Sierra Paper Co., Los Angeles, and Tarvener and Fricke, paper merchants of Los Angeles. G. I. Tompkins represented the Sierra Paper Co., W. E. Tarvener attended for the firm of

Frederick
Centrifugal
Pumps



Single-Suction Standard Paper Mill Stock Pump

¶ Before the development of Frederick Stock Pumps, the only pumps that could handle paper stocks of high consistencies without clogging were the old fan type pumps. They moved the stocks, but at an excessive power consumption. Paper Mills needed a type of pump that would move stocks efficiently, and would not clog. The first pumps to meet this need were Frederick Stock Pumps. The extensive and ever-growing use of these pumps in paper-mills, large and small, throughout the United States and Canada indicates that they are still leaders by a wide margin in this particular field.

Our Standard Stock Pump handles stocks of consistencies up to 4% with excellent efficiency. Our Super-Stock Pump will efficiently handle 6% stock.

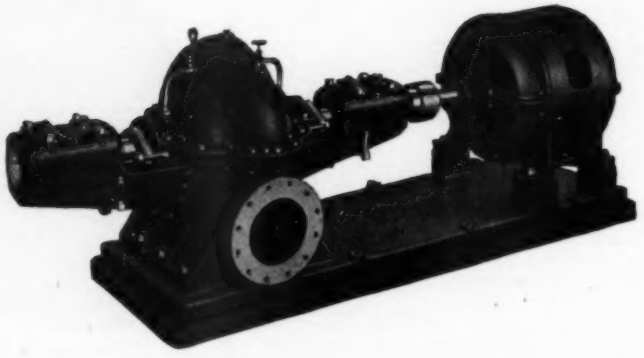
There is a Type of Frederick Pump Suitable to Every Need of a Paper-Mill

The Frederick Iron & Steel Company
Frederick, Maryland
In Canada:
Dominion Engineering Works, Ltd., Lachine, Que.

Bethlehem General Service Pumps for Paper Mills

Right:

The Bethlehem Centrifugal General Service Pump; made in capacities ranging from 200 to 17,000 gallons per minute against heads varying from 20 to 250 feet.

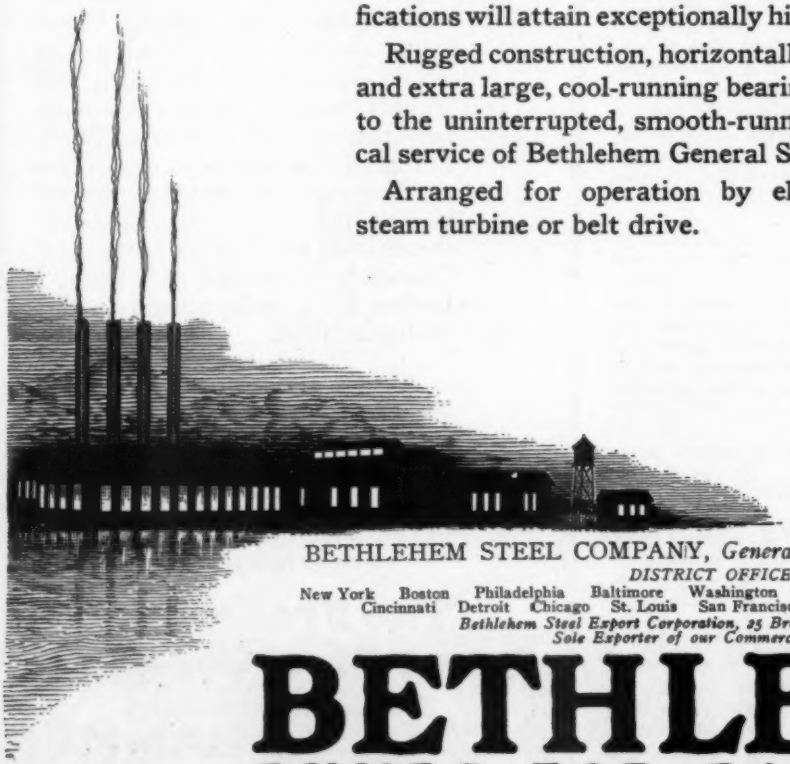


BETHLEHEM Centrifugal General Service Pumps are designed to handle large amounts of water and are particularly adaptable to service in paper mills.

Bethlehem Pumps designed to particular specifications will attain exceptionally high efficiencies.

Rugged construction, horizontally split casings and extra large, cool-running bearings contribute to the uninterrupted, smooth-running, economical service of Bethlehem General Service Pumps.

Arranged for operation by electric motor, steam turbine or belt drive.



The mechanical features of the Bethlehem Centrifugal General Service Pumps and a typical chart of characteristic curves are set forth in Bulletin XIII. We shall be pleased to send you a copy upon request.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

DISTRICT OFFICES:

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo Cleveland Cincinnati Detroit Chicago St. Louis San Francisco Los Angeles Seattle Portland

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM

PUMPS FOR PAPER MILLS

Tarvener and Fricke and F. L. Unthank and H. F. Bryn were present for the Oakland and Fresno Balke Moffitt and Towne houses.

Efforts to stop a practice of classifying wrongly some shipments of pulp and paper from Europe to America were reviewed by Charles Kahn, secretary of the association, in his annual report. The national association is assisting in this work. Some shippers, Mr. Kahn reported, are endeavoring to place their paper in lower shipping classifications to evade payment of the proper tariff. He also urged members of the organization to use their best efforts to have steamship companies adopt new and better regulations regarding the classification of carload shipments of paper.

F. G. Wright, of the Crown-Wlliamette Paper Co., of San Francisco, who has been prominent in the paper industry of the West since 1888 when he was bookkeeper for the old California Paper Co., gave a brief history of the industry on the Pacific Coast. This was read at the first session, which was a joint meeting between the Pacific States Paper Trade Association and representatives of the paper manufacturing plants of the West. In 1888, he said, there were seven mills in the West, the original Taylor mill at Taylorville, Marion County, Oregon; the California company's mill, the Lick mill at Agnews, California; the mills at Corralitos, Soquel and Antioch, California, and the Columbia River mill at Canas, Washington, operated by H. L. Pittock to supply paper to his Portland Oregonian.

Speaking of business conditions, Wight said that the West is finding markets for paper in other states, as it now is producing more than is consumed in this territory.

Sidney L. Willson, of Holyoke, Mass., president of the American Writing Paper Co., said that co-operation between manufacturers and jobbers was essential to the success of the manufacture and distribution of paper. W. Noble Gillett, of Chicago, vice-president of the National Paper Trade Association, spoke of paper trade conditions throughout the nation and said that printers, manufacturers and paper jobbers have mutual problems which they must work out together. "We must get together and talk things over," he said. "Nothing is gained by back-door subterfuge."

Fred Arnett and J. J. Herb, of the Pacific Coast Paper Mills at Bellingham, Washington, were introduced as representatives of the "baby" mill of the West.

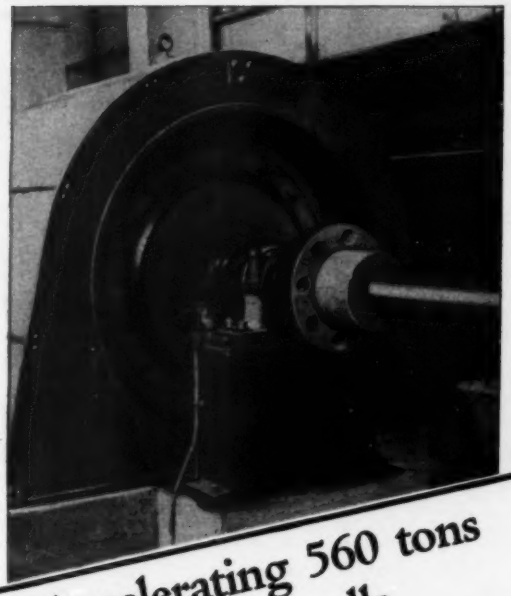
Besides choosing M. R. Higgins as president for a sixth term, the convention also elected the following: J. L. Murray, of the Mutual Paper Corp., Seattle, executive vice-president, and four other vice-presidents were chosen as follows: D. M. Woodward, of the John W. Graham Co., of Spokane; James Davis, of the Zellerbach Paper Co., Sacramento; N. D. Hopkinson, of Blake Moffitt and Towne, San Francisco, and William E. Tarvener of Tarvener and Fricke, Los Angeles. Charles Kahn, San Francisco, was re-elected secretary-treasurer for his fourth term.

It was decided to hold the 1928 convention and golf tournament at Del Monte, May 7 to 12.

Another important step taken by the convention was to further the interests of the industry by increasing the demand for paper by the approval of the nationwide advertising campaign proposed recently by the National Paper Trade Association marketing committee. James L. Smith, advertising manager of the Chicago Paper Co., came West to Del Monte to present the plan and found hearty support. He conceived the plan and is about to submit it to the various regional paper associations for approval.

The plan involves advertising in national publications and in booklet form to show manufacturers and merchants in all lines of industry how they can increase their sales by using more printed paper to support their personal sales work.

N. A. Schoenbucher of Chicago, secretary of the wrapping paper division of the National Paper Trade Association, explained a newly-devised method of arriving at costs in paper merchandising, known as the "Net Profit Control Plan." W. Noble Gillett spoke on the "1000-Sheet Plan" proposal which has been broached before paper trade associations throughout the country as a new method of arriving at sizes and weights for paper. A special committee of the convention recommended that the plan be adopted, beginning no later than October 1.



Accelerating 560 tons of dryer rolls with a C-H Magnetic Clutch

The C-H Magnetic Clutch installed on the Port Alfred Pulp and Paper Company's No. 1 Machine. Built by Bagley and Sewell Co.

SEE how they do it on the dryer section of the No. 1 machine in the mill of the Port Alfred Pulp and Paper Co., Port Alfred, Quebec.

It is a 234-inch machine for producing "newsprint" at 1000 feet per minute. The 40 dryer rolls each weigh 14 tons and are 5 feet in diameter.

A small motor geared to the section gives an initial acceleration to 100 feet per minute. The main driving motor is connected to the section by a 54-inch C-H Magnetic Clutch. The clutch is engaged and the section is brought from 100 feet to 1000 feet per minute without jerk or jar to driven equipment or motors.

Note the simplicity of the C-H Clutch. No small moving parts to give trouble.

Notwithstanding the inertia of the 560 tons (the weight of the rolls) acceleration is not a problem. The automatic, smooth load pick-up characteristics of the clutch eliminate the shock and the consequent wear and tear on equipment.

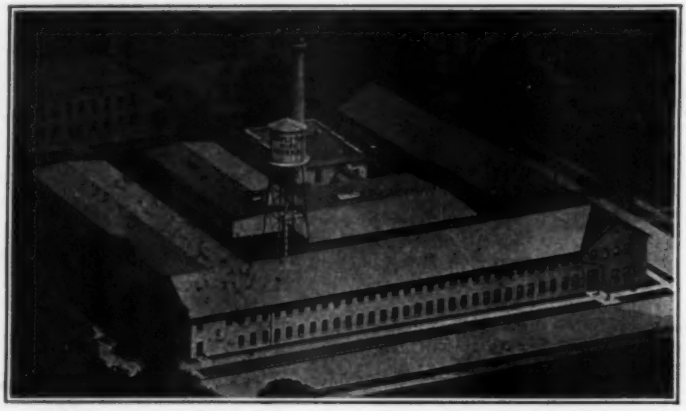
Send for this interesting booklet

Complete information on the construction, operation and use of Magnetic Clutches is contained in C-H Publication P-11.

Many paper mill uses are pictured and described. If you haven't a copy already we'll be glad to send one on receipt of your name and address.

The CUTLER-HAMMER Mfg. Co.
Pioneer Manufacturers of Electric Control Apparatus
1254 St. Paul Ave., MILWAUKEE, WISCONSIN

CUTLER C-H HAMMER
Industrial Efficiency Depends on Electrical Control



APPLETON WIRES

Fourdrinier Wires
Cylinder Wires
Save-All Wires
Washer Wires

Dandy Rolls and Cylinder Moulds repaired and recovered.

Over fifty years of experience in manufacturing wires for American Paper Makers, and the ever increasing use of APPLETON WIRES testity to their quality.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC., APPLETON, WIS.

New Water System For Aberdeen

The Pacific States Pulp and Paper Co. has exercised its option on a 29-acre mill site near Aberdeen, Wash., following approval early in May of $1,600,000 bonds for the construction of a commercial water system to supply Aberdeen with 60,000,000 gallons of water daily.

Bids for clearing the site have been called for and immediate negotiations with the city for water are to be undertaken. The site is just outside the city limits of Aberdeen on the Chehalis River.

Prior to the water bond vote it was announced by L. E. Van Winkle, with offices in Aberdeen, said to represent outside interests in the East, that action by the principals here presented depended upon the water bonds vote. In a statement after the option was exercised, Van Winkle said that the land will be filled in and then construction work will begin. The first unit is to be 100 tons capacity, sulphite pulp. The Pacific States Pulp and Paper Co. was incorporated last March with a capital of $149,000.

One of the largest single orders for gears placed on the the Pacific Coast was handled in April on a rush order by the Western Gear Works of Seattle when that company turned out fifty-five steel gears, each measuring about six feet in diameter, for the Washington Pulp and Paper Co., at Port Angeles, Wash. The gears were installed on the dryer end of the new 236-inch fourdrinier, just placed in operation.

Forest Supervisors Convention

Forest supervisors of the National forests west of the Rockies were in attendance at a ten-day meeting from May 6-16.

The first six days of the convention were held at the Sauk River Lumber Co., and the other four days at Darrington, eighty miles north of Seattle.

Future On Pacific Coast

Chester Thorne, chairman of the board of directors of the National Bank of Tacoma, declared recently that development of a pulp and paper industry on the Pacific Coast on a sound basis is inevitable. He said he had met several representatives from eastern companies, and some of them were looking toward immediate entry into the field. Others were gathering a perspective for future action. They were preparing themselves because of a general realization that a big development is due on the west coast.

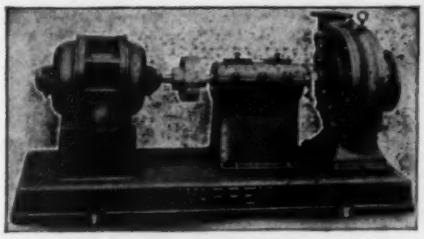
Since the business is one requiring large capital, Thorne pointed out sound investigations must precede developments and surveys must be thorough. The west offers new conditions and demands new methods. Remedies must be found for some mistakes now being made. The matter of waste from saw mills as a source of supply for pulp manufacture requires careful study, Thorne declared. The volume of supply and the certainty of its continued existence must be thoroughly gone into and the suggestion was made that several saw mills can probably profitably combine on a single pulp proposal.

Valley Iron Works on Pacific Coast

Reorganization of the Smith and Watson Iron Works, extension of its activities in Portland, and equipment of the plant at Front and Harrison Sts., Portland as the first factory for pulp and paper-making machinery on the Pacific Coast, took place recently when the Valley Iron Works, of Appleton, Wis., acquired a substantial interest in the company.

The capital stock of the company is to be increased from $100,000 to $500,000, and an expenditure of $200,000 will be made in the next year and a half remodeling and fitting up the factory. The new company will be known as the Smith & Valley Iron Works Company.

W. G. E. Smith, president of the Smith & Watson Iron Works will retain his position in the new company, with S. C. E. Smith as vice-president, and E. A. Peterson of the Valley Iron Works will be vice-president and director of the



Warren Stuff Pump for handling pulped stocks up to 5% and higher consistency.

Warren Pumps

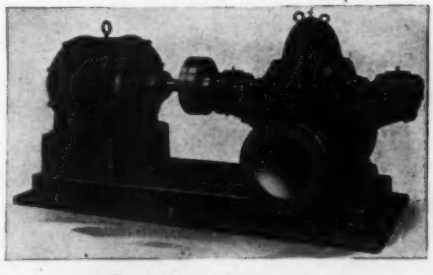
For the Three Tour Grind

Warren Pumps for pulp and paper mill service have a reputation for staying on the job twenty-four hours a day.

Mills that have standardized on Warren Pumps trace fewer shutdowns to their pumps.

If continuous and lasting dependability in the handling of your pulped stocks and water seems to you of real importance it is no less important that you specify pumps that assure such dependability—Warren Pumps.

May We send Bulletins or estimates?



Single-Stage Double Suction Pump

Warren

Steam Pump Company

Incorporated

Warren, Mass.

Boston Atlanta St. Paul Toronto San Francisco
Philadelphia Chicago Scranton New York Pittsburgh
Dallas Oklahoma City St. Louis

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Wherever paper is made!

Look for GOULDS Centrifugal stock PUMPS

Mail the coupon below for special bulletin "The Manufacture of Paper and Pumps Used," compiled by Goulds engineers, printed by Lefax; also for Bulletin 128 describing Goulds new type Centrifugal Stock Pump.

Paper manufacturing plants the country over have made large installations of Goulds Centrifugal Stock Pumps, after having our Engineering Department carefully study their problems and offer unbiased recommendations. The illustration above shows a typical Goulds installation, at the Eastern Manufacturing Company, Bangor, Me. Five other similar Goulds Centrifugals are now in use at this company's plant, pumping 2% to 4½% bond and writing paper stock against a 45-foot head. Capacity 1600 G. P. M. at 1450 R. P. M. These pumps are giving such satisfactory service that this company's old-style closed impeller pumps are being replaced with Goulds open impeller Centrifugals.

Whenever you have a pumping problem to solve, mail us all data and specifications. Our engineers will carefully study your problem and make unbiased recommendations.

GOULDS PUMPS INC.

Seneca Falls, N.Y.

COUPON

GOULDS PUMPS, INC.,
Seneca Falls, N. Y.

Please send me Pump Bulletin 128 and special bulletin "The Manufacture of Paper and Pumps Used."

Name .....

Address .....

reorganized company. The decision to establish a factory here for the manufacture of pulp and paper-making machinery was the result of a careful study of the industry and resources on the Pacific Coast, which according to E. A. Peterson is the section of the country where future development in the paper manufacturing business lies.

Walter S. Rooney of the Albany Felt Co., Albany, N. Y., returned to the United States several weeks ago from Japan, where he went in January to visit a good many mills. After returning to San Francisco, he visited a number of the mills on the Pacific Coast.

Russel J. Hubbard, engineer and mill executive at Reedsport, Ore., is planning a 50-ton sulphite pulp mill to be constructed at Reedsport, and to be in operation in approximately six months. An application for water to operate the first unit has been filed, estimating the use at between four to five million gallons a day. A chipping plant will be installed.

The Newberg, Oregon, plant of the Spaulding Pulp and Paper Co., will begin operations in the fall of 1927 on sulphite pulp.

Establishment of a 50-ton sulphite pulp mill at Tacoma by William Stuart Dowd, is reported as probable. Mr. Dowd came to Tacoma recently from New York and has spent about twenty-five years in major business ventures. He left for the East early in May but will return West shortly.

The city of Port Angeles has agreed to deliver 2,000,000 gallons of water daily to the Washington Pulp and Paper Corp. The company will advance $11,000 towards construction of a pipe line.

A log boom to handle hemlock especially cut for the plant of the Pacific States Pulp and Paper Co., Junction City, Wash., has been planned, besides a large dock for mill waste. The plant will cost about $1,000,000, and will produce 100 tons of pulp daily.

A guarantee of 14,000,000 gallons of water daily to pulp interests has been made by Raymond, Wash, city commissioners, but those seeking locations were not named.

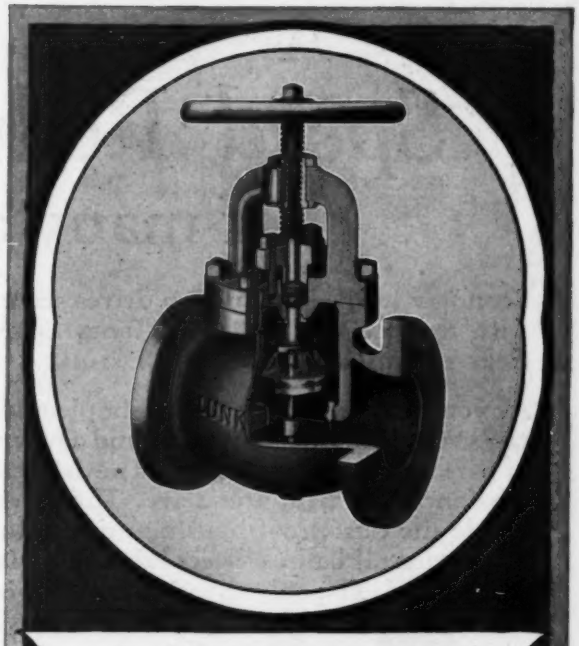
The Grays Harbor Pulp Co., Hoquaim, Wash., has filed an amendment reducing its capital stock from $1,900,000 to $1,650,000.

Anacortes Mill Turns Waste Into Profit

The Fidalgo Pulp Mfg. Co. has just announced election of the following officers: Ossian Anderson, president; William Morrison, vice-president, and O. M. Green, secretary-treasurer. This plant has made their daily output forty-five tons of sulphite paper pulp, three shifts being employed, and the plant running to full capacity.

The origin of this plant can be traced to the utilization of scrap tin in Pittsburgh. Louis Muench of Olympia was a can manufacturer, who for many years saw great piles of scrap tin that was not merely a waste, but cost owners considerable expense to find dumping grounds. Then a chemist discovered a way to remove the tin from the steel and do it cleanly. At once the scrap became valuable. Mr. Muench declared that the tin scrap now pays the dividends for a can factory, and points his story to the origin of his becoming interested in the manufacture of wood pulp, which also utilizes a waste. Consequently, when a chemist came to him and told him he had a process for making wood pulp from the short pieces of spruce coming from Western Washington sawmills in the manufacture of lumber, he was interested at once.

He then made an extensive investigation of the practicability of manufacturing paper pulp commercially from saw mill waste, and then announced his readiness to sanction the aid that the chemist had asked of the State Chamber of Commerce, by subscribing $15,000, and began a canvass of Western



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GLOBE, ANGLE and CHECK VALVES

are procurable in Bronze, Iron and Steel, in all standard sizes, for all prevailing pressures and temperatures. The completeness of the line facilitates selection of the correct type for any service.

And when you purchase Lunkenheimer Valves, you are getting the accumulated results of highly developed design, carefully selected and tested materials, and a manufacturing experience extending over a period of sixty-five years in the production of high grade Valves and Engineering Appliances.

Lunkenheimer Distributors are located in all industrial centers and carry complete stocks. They will fill your requirements promptly.

THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.
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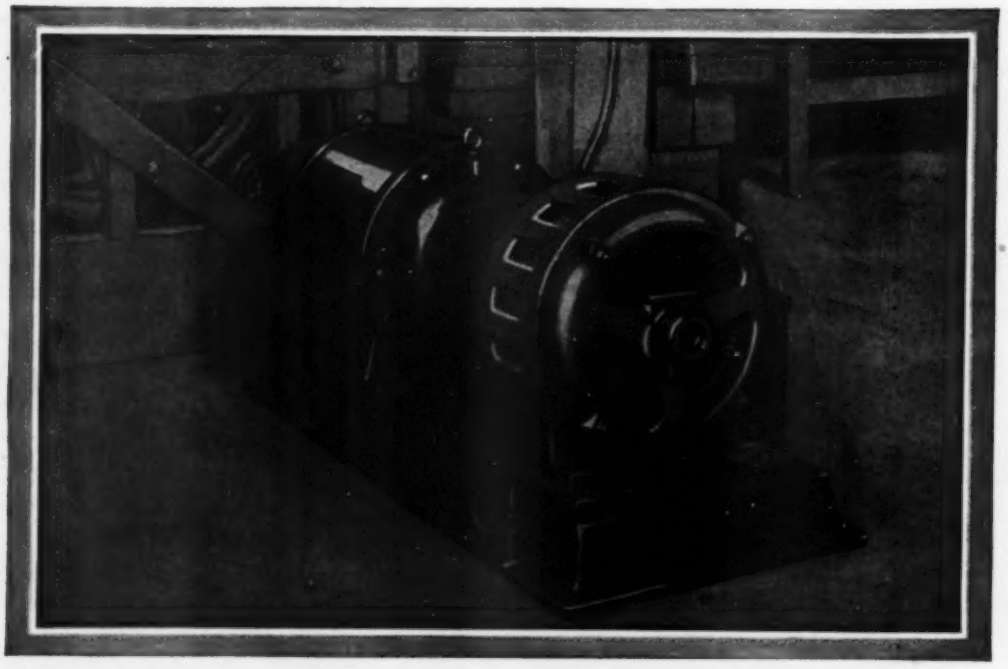
A *Speed Reduction Unit* of many advantages

Economy in speed reduction drives starts with the decision to install Jones Spur Gear Speed Reducers.

As you can see, installation is simple and costs very little. Space is saved and danger of personal injury is avoided. The drive is a balanced, straight-line drive. The gears inside the dust-proof housing operate in a constant oil bath. Perfect lubrication is maintained. The only attention required is occasional replenishment of the oil supply.

The illustration below is from a photograph of a Jones Spur Gear Reducer driving a sugar crusher. Jones Reducers are operating constantly, many of them twenty-four hours a day, in every branch of industry where high speed motors are used to drive slower moving machines.

If you have a speed reduction problem, write us. Our engineering department will be glad to help you. Write, too, for Speed Reducer Catalogue Number 26.



Jones Speed Reducers

W. A. Jones Foundry & Machine Company

Main Offices and Works: 4436 West Roosevelt Road, Chicago

Branch Sales and Engineering Offices:

New York Cleveland Milwaukee Pittsburgh Buffalo Detroit
Birmingham St. Louis Cincinnati Peoria Los Angeles San Francisco

Washington for the rest of the capital. His job of getting the money was no easy task, but since then paper pulp plants utilizing mill waste have come into favor. One began operation in Shelton recently. One commenced running at Emmonds in the winter. Tumwater is building one. Longview, Hoquaim and Raymond are getting ready to do so. Bellington has two and plants are in operation at Port Angeles. Mr. Muench declares that every saw mill should have a paper pulp plant along side of it.

Zellerbach News

A financing campaign has been launched by the Zellerbach Corp., and its subsidiaries for $3,000,000 of 30,000 shares of preferred stock. The expansion program in connection with the campaign for funds is said to involve $12,000,000 and is to include the erection of additional plants and the installation of new machinery.

Plans are reported to be under way for a kraft paper mill some place on Puget Sound. Completion of the plans for the new project which is expected to cost $2,500,000 are expected to be completed in June.

Additional expansion projects include the expenditure of $4,000,000 at Port Angeles to increase the Washington Pulp and Paper Co.'s newsprint mill capacity from 140 tons to 275 tons per day, and to more than double the capacity of the Northwest Power and Light Co.; the erection of a new sulphite mill at Hoquaim, for which ground has already been broken, and which will cost approximately $3,000,000; the expenditure of $2,500,000 for the new sulphite pulp mill at Shelton in which the Zellerbach company is heavily interested.

The shares which are being offered locally by Blythe, Witter & Co., and also by J. Barth and Co., starting June 1, 1927.

Two hundred tons of new papermaking machinery for the Columbia River Paper Mills arrived on the steamship Eastern Knight at the port on May 22, and a second shipment was expected to arrive two weeks later. The Japanese ship Taigen Maru arrived in port on the same day to load 1,400,000 feet of lumber for Japan, shipped by the same company.

William B. Senseman has been appointed Pacific Coast District Manager for Combustion Engineering Corp., Raymond Bros., Impact Pulverizer Co., Ladd Water Tube Boiler Co., and Heine Boiler Co., all subsidiaries of International Combustion Engineering Corp. The offices are located in Subway Terminal Bldg., 417 Hill St., Los Angeles, Cal.

A. P. and P. A.'s Weekly Review

Beginning with this week's issue, the Weekly Business Review published by the American Paper and Pulp Association is printed in a manner more suitable for use and easier to read.

This weekly bulletin has gradually developed to the point where it is receiving considerable attention by the industry because of its clear analysis of various other general situatries which tend to influence the consumption of paper and because of its clear analyses of various other general situations which are of interest and importance to the paper industry.

The association plans to give in this bulletin matters of interest concerning the association's activities and statistics of paper and pulp as well as brief reports on raw materials.

When the Weekly Business Review has attained the above features, it would seem that the bulletin will be one of the most useful of its kind to the paper industry.

Court Confirms Sale of Andrews' Assets

The sale by the New York Trust Co., ancillary receiver for the Andrews Paper Co., of the local assets of the concern to S. Walter, Inc., for $39,134.21, was confirmed by court recently, there having been no objections filed by creditors to the petition as filed a short time ago.

The new controlling company will operate the business under the name of the Andrews Paper House, and it will be a branch of the Philadelphia plant, with B. R. Moore, continuing as manager for the Walter people

The **ROTOSPRAY**

CLAY SIFTER

The saving in the cost of screens pays for the machine itself

Does Not Vibrate or Gyrate

Supreme in Service as in Saving

Now in Operation in Many of the Largest Mills

The screen lasts 4 to 5 times as long as on any other sifter. Life of machine itself almost indefinite. Large Capacity, Economical to operate—Labor-Saving—Cleans itself automatically. Shipped on 30 days' trial.

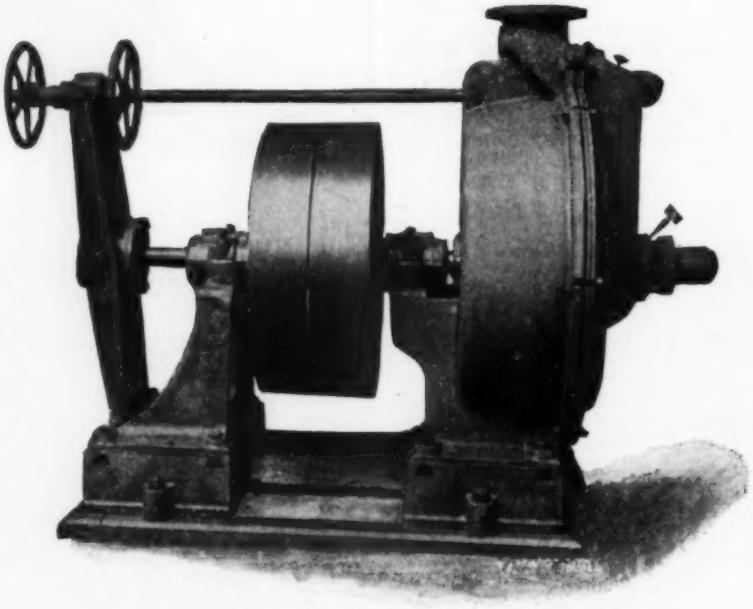
Write for particulars.

THE ROTOSPRAY MFG. CO.

358 West Madison St. Chicago, Ill.

One sure way to eliminate waste in your pulp mill

Install a Voith *Refiner!*



Quite a number of representative pulp mills in this country and Canada have installed Voith Refiners and by working up their ground wood, sulphite and sulphate tailings in them are obtaining from their wood the highest possible yield. WHY NOT YOU?

We shall be glad to furnish particulars

American Voith Contact Company, Inc.

280 Madison Ave. New York

NEW ENGLAND NEWS

Modification of 1000 Count

Boston paper merchants are informing their trade and the manufacturers that they have greatly modified the 1000 sheet count. The New England Paper Merchants Association has discussed the system at several of its meetings, and it was generally admitted that the markup on cover reports was excessive.

It is understood that several leading merchants will start pricing their paper as of June 1 on the basis of the original mill package with a markup of 33 1-3 per cent for broken packages. Under this modified plant, the basis of count will continue to be 1000 and the weight and size basis will be unchanged. The original mill package, however, will be the basis of pricing. In the case of bond, ledger and book papers unwrapped, 500 sheets will be considered the minimum to be purchased at the straight 1000 count price, while 250 sheets will be the usual minimum on cover papers and 100 sheets on cardboard.

There will be some slight variations, however, some of the merchants preferring to allow the mill package to be the absolute factor, thus in the rare cases where heavy cardboard is wrapped, 50 sheets to the package at the mill, or cover papers in 100 or 500 sheets to the package, that will be the governing factor in pricing, and the markup will obtain if the package is "broken." Action somewhat similar to this has already been taken by the Providence and Portland merchants.

Tileston & Hollingsworth Co. have not at any time adopted the principle of markup involved in the 1000 sheet count, and as this form of manufacturers sell their paper direct, their influence on the merchants was undoubtedly a large factor, for the 1000 sheet count has been decidedly unpopular with the Boston Typothetae.

American Writing News

President S. W. Willson of the American Writing Paper Co., has returned from a three weeks' trip throughout the west which took him to the Pacific Coast. Mr. Willson is conservative in his utterances on business conditions, but he was free to admit that the demand for the company's papers has improved materially since reorganization was effected, and the West is taking hold of the A. W. P. lines with enthusiasm. Meantime the consolidation of work in as few mills as can operate at 100% is having its effect on the financial condition of the company. The earnings have been good and manifest savings in time, power and freight have been accomplished with some saving in labor.

The Choral Properties, Inc., recently formed, are subsidiary to the American Writing Paper Co., and the transfer of the Riverside, Oakland and other divisions to them are for the purpose of segregating this work of disposing of these properties. The tenements of the Oakland division at South Manchester, Conn., have been sold to Morris Housen, formerly superintendent of the Oakland mill and now connected with the Irving Paper Co.

The American Writing Paper Co. has secured an order from the Republic of Colombia for documenatry papers. Alfredo Paris, chief of the purchasing department of the commercial section of the South American Republic, together with Eduardo Gamboa, proprietor of Papereria Samper Matiz, the A. W. P. representatives at Bogota, Colombia, visited the mills at Holyoke during the past month.

Brown Co., at Berlin, N. H., have completed installation of their Combustion Engineering Co., stokers in the plant. Operations for the first weeks are said to indicate a higher rate and a material gain in efficiency of the boilers.

The Paper City Mill Supply, Inc., of Holyoke have filed a voluntary petition of bankruptcy listing assets at about $20,000 and liabilities at $83,000. Creditors include the City National Bank of Holyoke, H. Goodman & Sons, E. Gross of Hartford, Massachusett Mill Supply, and S. Silverman. The

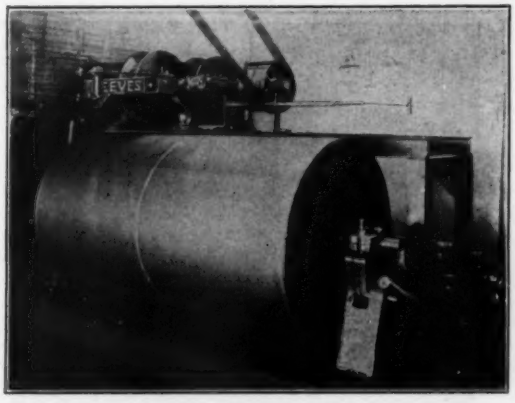


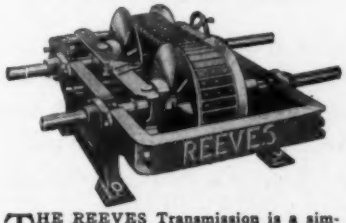
Photo shows a REEVES Transmission operating a Winder at the Cottalap Company, Somerville, N. J.

Eliminate the Torn Sheets in Winding!

IT's easy to reduce the waste in torn sheets on your winders when you have the REEVES Variable Speed Transmission. This simple device regulates the speed of the winder and synchronizes it with the speed of the paper machine so that the speed is changed for each difference in the size of the roll. The REEVES is so accurate and so sensitive that torn sheets are reduced to the minimum.

You should have all the facts about the REEVES. Write for catalog A-66 and full information about its application to Cylinder and Fourdrinier Machines, Cutters, Winders, Slitters, Pasting Machines and many others in your plant.

REEVES PULLEY COMPANY
Established 1887
COLUMBUS, INDIANA



THE REEVES Transmission is a simple, compact mechanical device which receives power at a constant speed and delivers it at any speed desired to any machine or group. It will maintain one set speed indefinitely, or may be changed instantly to meet any different operating condition. Accurate and dependable, always.

REEVES
Variable Speed Transmission

Couch Roll Slides Back To Provide Slack When Making Wire Changes

When wire changes are made on the Keystone Fourdrinier, the Couch Roll slides back to provide slack, and the Breast Roll is stationary. The Table Roll and Suction Box Sections are removed independently, as two separate units and rolled out on the rails. Since the Breast Roll is not moved vertically the removal of the Table Roll Section does not affect the Apron, therefore no adjustments of the inlet are disturbed. Furthermore, the machine rolls back into precisely the same position that it was before the wire was changed and production can be started without making any adjustments.

These are only a few of the exclusive features obtainable in the Keystone Fourdrinier. Write us for complete information, list of users and also ask us to explain the advantages of removing in two sections and how the wire can be pitched without affecting inlet adjustments—no obligations. When in need of a Fourdrinier to make News, Kraft, Book, Tissue or Specialties, let us bid on your requirements.

Our Products Meet Our Promises

KEYSTONE Fourdrinier

Downingtown Mfg. Co.-East Downingtown, Pa.

Federal District Court at Boston has appointed Walter L. Stevens Referee in Bankruptcy.

Nashua Gummed Paper Granted Injunction

Nashua Gummed & Coated Paper Co., Nashua, N. H., has been granted an injunction by the Federal District Court at Boston, against the McLaurin-Jones Co., of Brookfield, Mass., enjoining the latter firm from using the patented method owned by the Nashua company, for the manufacture of gummed strips.

The machine was patented by B. C. Bundy and purchased by the Nashua Gummed & Coated Paper Co., who alleges infringement against the Brookfield converters, the latter stating in their defense that the patent was not valid as the method has been previously in use. The decree of injunction is issued without costs or damage awards against either parties.

The Marvellum Co., converters of Holyoke, have just placed a new parchment paper for radio loud speakers on the market. It will be known as "Marveltone," and will be distributed by agents throughout the country.

Significance in New Size Dollar Bill

The reduced size of the new dollar bills which has created widespread interest, will not affect the type of paper used, yet is considered significant as representatives of several Holyoke and other Western Massachusetts mills were present recently, along with Winthrop Murray Crane, whose company at present has the contract for the making of the money paper, at a conference with Assistant Secretary of the Treasury Dewey.

These men were shown through the Bureau of Engraving and printing and instructed in the qualities necessary in the paper used. Many other paper officials were also present.

Pulp and Paper Traffic League Meet

The meeting of the Pulp and Paper Traffic League was held at the Copley Plaza Hotel, Boston, on June 7-8-9.

The docket includes report of the committe on constitution; report from committee on freight rate adjustments as handled by carriers; rates on cores in carloads and less; history of paper rate complaints past and pending, and relation of such cases to docket 17,000; shippers' difficulties in getting damage claims paid when cars are loaded under the acme or Gerard unit system; proposed revision of tariff circular; action to be taken by this league with the American Railway Association with reference to changing some methods now used in building box cars; action league shall take on question of buying or leasing sidetracks built by the carriers wholly or partly at their expense, (while this is not a local question it promises to become a national one); rates on paper winding cores under section 6, rule 12; return of cores second hand from Canada to the United States; various features surrounding shipments of paper on skids; damage to paper in switch movement; handling of pool cars at ultimate destination; minimum weight on new print from Canada to the U. S.; question of correct shortline mileages between mill shipping points and consuming centers; motor truck rates on paper in carload quantities and less; lack of uniformity relative to station employees refusing to assist truck drivers when there is no helper on truck; election of officers and new business.

The League, which is broadly represented by the paper industry of the United States and Canada, excluding only the Pacific Coast and the south, will have a special trip on a chartered boat about Boston Harbor inspecting the wharves and terminals, a bus trip to Lexington and Concord, an inspection of the Boston Post's press room (the largest in New England), a bus trip to Plymouth including a shore dinner, and a banquet at the Copley-Plaza on the second evening. To this banquet a group of some 40 paper executives have been invited.

Eagle Lodge of Paper Makers in Holyoke is understood to be planning a drive to further unionize the paper industry of that city. Efforts have been made to immediately increase the membership of the local union by securing adherence of

Since 1827—

WALDRON— for Paper Converting Machinery

For One Hundred years, the John Waldron Corporation has been continuously engaged in the manufacture of high grade machinery, principally for paper converting. A large number of the best known standard paper products are being produced on Waldron machines.

Where greater output, better finish and lower maintenance costs are factors, Waldron machines are always first choice. Long experience and specialized knowledge of designing and building, combine to insure the well known Waldron quality.

Embossing and Printing. Gumming and Coating
Winders, Slitters, Reels. Wall Paper Machinery
Waxing and Sizing. Sand Paper Machinery
Mechanical Festooning Machines

Write to our nearest office for any information desired.

JOHN WALDRON CORPORATION

Main Office and Works
New Brunswick, N. J.

208 West Washington Street, CHICAGO — **30 East 42nd Street, NEW YORK**

REED SPAFFORD

Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

Improved Paper Machinery Company

Nashua, N. H., U. S. A.

the beatermen, washermen, stockdiggers and third and fourth machine hands. Modification of dues and initiation fees are to be made to accomplish this purpose.

Strathmore Paper Co. were hosts during the past month to 200 members of the Graphic Arts Industrial Committee at Woronoco, Mass. The mills were inspected in the afternoon and talks given by officers on the Strathmore Papers and the care used in their manufacture.

Despite the all pervading dullness in the rag market, the Brown Co., of Berlin, N. H., continue to enjoy splendid business on their famous Alpha fibre which enters directly into paper manufacture, quite often in competition with rags. Its place is secure, and the producers are sold up for months ahead. Many persons have been under the misapprehension that the Alpha fibre is sold to rayon mills. Brown & Co. make a special Silkapha which sells to the rayon trade, but this commands 8 cents mill against 6 cents straight Alpha fibre used in fine paper making.

Deerfield Glassine Company

The Deerfield Glassine Co., Munroe Bridge, Mass, is a new company formed by the Shortess interests, who in 1921 acquired the interests of the James Ramage Paper Co., at that site. They erected brick and concrete buildings at that time in conjunction with the New England Power Co., who had acquired power rights and land in connection with their power developments on the Deerfield River.

The new company will be equipped with special machinery for the manufacture of specialty papers, particularly light weight glassine.

The new directors of the company are Joseph H. Wallace, president, William G. Shortess, vice-president, William L. Ross, treasurer, Frank E. Greenwood, secretary and Edward Costigan, production manager.

Lawrence Machine Reconstructed

Recently, we received an interesting announcement telling the story of the unfortunate fire in the Lawrence Machine Co., a brief story of the determination and courageous work of James Lanigan, owner of the company, and the good news that the company has built a new building and is ready to take care of three times their former business, and render much quicker service.

The determination of this man who is but eighty-three years young, to face and solve the problem of rebuilding, is a noteworthy one, and we look forward for the great and continued success of the Lawrence Machine Co. in their new home .

Arthur B. Thorpe

Arthur B. Thorpe, 58 years of age, treasurer and general manager of the Franklin Paper Co., of Holyoke, died recently. He was connected with the Franklin Paper Co. for 27 years, and until last year when he was made treasurer, he had been vice-president and superintendent.

He obtained his early experience in the paper trade with the James Ramage Paper Co., of Munroe Bridge, Mass. He was very active in masonry work.

George M. Graves Co., 77 Summer St., Boston, are pushing the well known phosphor bronze wires of M. Sternberg, England. They have been appointed American agents for the phosphor bronze wires which are available in any time for any class of papermaking.

John J. White & Son of Holyoke, handling paper mill machinery, have been incorporated under Massachusetts laws with $25,000 capital stock. John J. White, Jr., is treasurer and clerk.

The New York-New England Co., Holyoke, have announced a new line of cover stock to be known as "Veteran." It is an embossed and coasted leatherlike paper available in many

Variable Speeds in The Paper Industry

Variables in the processes producing paper demand variable speed machinery. To enable the operator to secure the speed best suited to the changing conditions use a LEWELLEN VARIABLE SPEED TRANSMISSION. LEWELLEN is solving the problem of variable speed on the following:

Coaters, conveyors, box making machinery, embossing machines, creping machines, paper machines, winders, pumps, binder board machines, sheet dryers, festoon dryers, supercalenders, sheet cutters.

LEWELLEN is solving these problems because behind a soundly designed transmission of guaranteed structural quality is experience.

We have recently issued a catalog describing the Lewellen Variable Speed Transmission in detail. Just a card will bring a copy.

LEWELLEN MFG. CO.

Columbus, Indiana

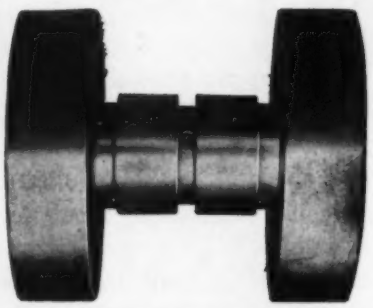
Above photo shows a Lewellen No. 15, Class "H" Complete Ball Bearing Transmission driving a binder board machine at the Kerr Paper Mills, Downingtown, Pa.

LEWELLEN
Variable Speed
TRANSMISSION

THE JOHNSON FRICTION CLUTCH

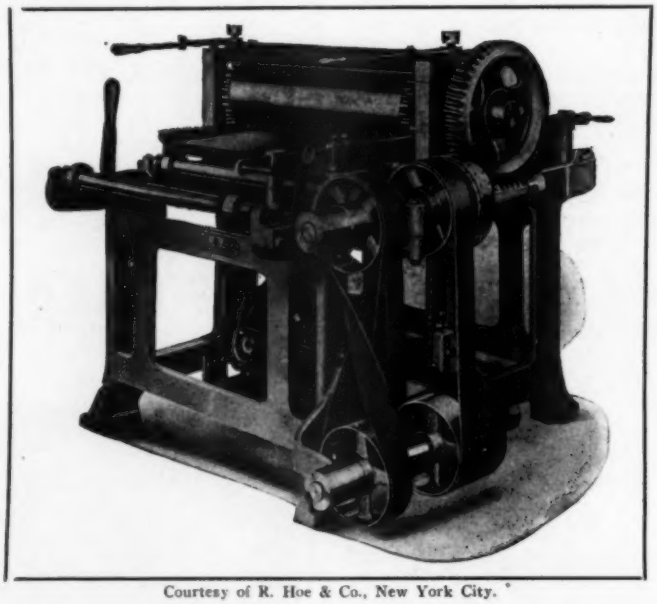
as used on the

R. Hoe & Co. Matrix Rolling Machines



DOUBLE CLUTCH WITH PULLEYS MOUNTED ON HUBS

WHEREVER in civilization the printed word goes, the name "Hoe" is known. On their Matrix Rolling Machine, shown below, a Johnson Double Friction Clutch gives very satisfactory service. It is on the worm shaft between open and crossed belt pulleys. Superintendents' attention especially invited to this installation.



Courtesy of R. Hoe & Co., New York City.

The clutch is engaged by hand to drive the bed under the roller in either direction, and is disengaged mechanically at the end of the travel. JOHNSON Clutches perform splendidly on all printing presses and electrotyping machinery. Durable. Compact. Powerful. Easily adjusted. Easily lubricated. Long life.

The JOHNSON Clutch has the approval of the leading paper machine builders for all kinds of machinery where medium or light power is used. Our engineers give suggestions as to how it will fit your particular machine. Get our illustrated clutch reprints explaining countless installations. Equip with JOHNSONS.

Write for Catalog P. I.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

colors and suitable for greeting cards and announcement work.

End of New Jersey Coated Paper Co.

The New Jersey Coated Paper Co., Montclair, N. J., where Ed. T. A. Coughlin was employed for a time as superintendant after he left the Franklin Coated Paper Co., Franklin Ohio, has been definitely shut down.

With the discontinuance of operations of a large number of coated paper workers are now without employment. The plant was conducted as a division of the United States Printing and Lithographing Co., of Cincinnati.

NORTHERN NEW YORK NEWS

Freight Rate Complaints

J. A. Quinlan, traffic manager of the St. Regis Paper Co., has filed complaints against the Atchison, Topeka and Santa Fe R. R. and the Ann Arbor road. Two of the complaints were filed on behalf of the St. Regis Co., and the other by Taggart Bros., Inc.

The complaint against the Ann Arbor road is with reference to the rates on wrapping paper. The present rate is 44½ cents per pound. Complaint asks that the defendants be made to answer charge with reference to the rates on paper shipped from Black River and Carthage to destinations within the states of the Middle West and the states south of Pennsylvania, rates shall not be relatively higher than the rates contemporaneously maintained and applied by them for the transportation of wrapping paper from competitive producing points named or such other rates as the commission may deem reasonable and just; and to pay reparation to the complainant on shipments that have been moved for a period of two years prior to the filing of the complaint.

The complaint against the Santa Fe asks that the rate on newsprint from Carthage to Chicago be reduced from 38½ cents per hundred pounds to 26 cents.

Taggart Bros., Inc., complaint alleges that the rate on paper bags from Watertown to the Middle West, 44½ cents per hundred pounds is excessive.

Changes at International Mills

Changes are being made on some of the machines of the old DeGrasse Paper Co., Pyrites, now International's mill, for the purpose of producing a higher grade of newsprint required for the picture sections of newspapers.

International took over the DeGrasse Mill May 1, and the transfer of property included the High Falls Paper Co., at Chateaugay, St. Georges Paper Co., Connecticut, St. George Pulp and Paper Co., at St. George, N. B., with its 250,000 cords of pulpwood, the Ogdensburg Pulpwood Co., with its extensive terminal at Ogdensburg and the Mount Murray Woodland Pulp Co., and Murray Bay, P. Q., with its 300,000 cords of pulpwood.

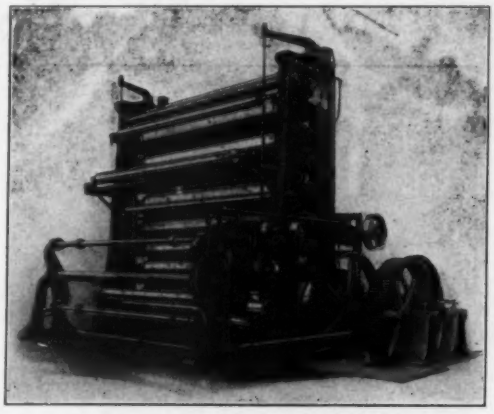
The alterations planned will cost about $100,000 and the mill will eventually be given over entirely to the manufacture of Rangley papers. The Rangley process involves working a percentage of the clay into the paper fibres, giving a smoother texture. E. A. Charlton, manager of the DeGrasse mill pointed out that owing to the duty, it is impracticable to import the Rangley process paper from Canada.

Wilfrid O'Neil of Deferiet, an employee of the St. Regis Paper Co., was badly injured when a stick of pulp which he was sawing flew up and fractured his skull.

St. Regis Controls Northeastern

Floyd L. Carlisle, president of the St. Regis Paper Co., has announced plans to acquire control of the Northeastern Power Corp., of which Mr. Carlisle is chairman of the board.

At present the St. Regis owns 852,660 shares of Northeastern and this amount is to be increased to 1,452,660 shares. The purchase will give St. Regis approximately 51 per cent



A Message From

NORWOOD

Especially for

MR. MILL SUPERINTENDENT

HAVE you got some problems dealing with paper mill machinery? Or with filtration of the water entering your plant?

If you have, we suggest that you get in touch with our engineers and take advantage of the free consultation service that we maintain for your benefit.

Over thirty years of experience in building paper mill machinery and filters has given us quite a bit of knowledge about the problems of paper making. The benefit of this experience is yours for the asking.

Of course if you have no problems, but just need some additional equipment, we know that you'll appreciate the advantages of dependable Norwood Paper Machines and Water Filters.

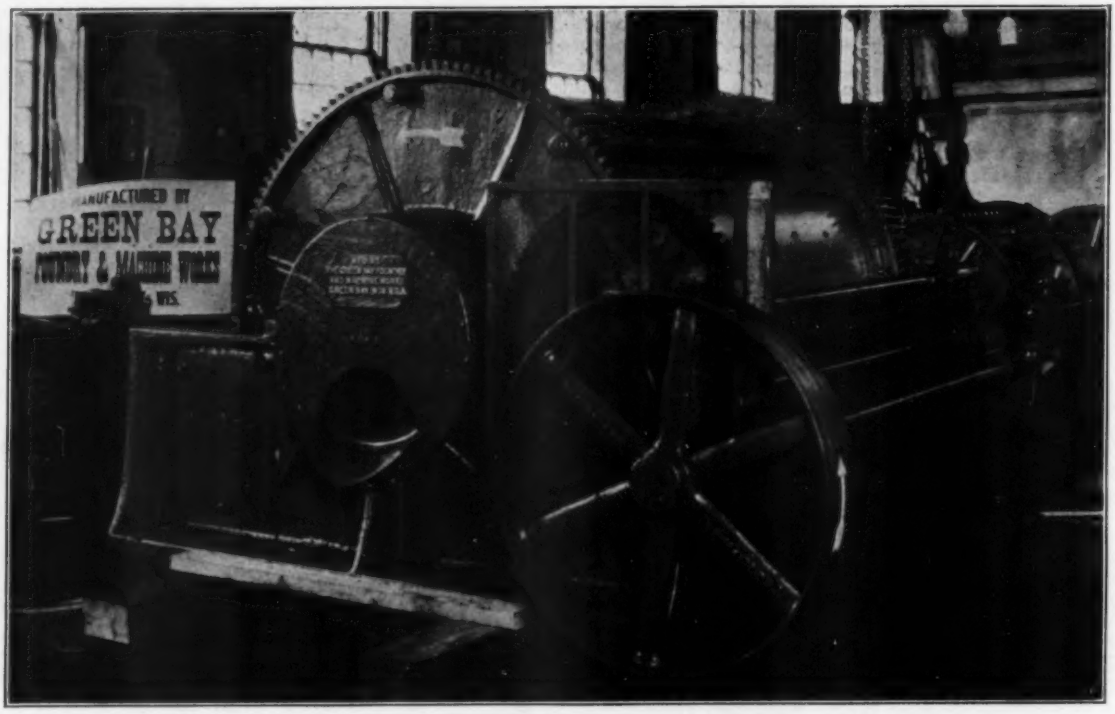
We are always glad to furnish catalogs, specifications and prices.

NORWOOD ENGINEERING COMPANY

FLORENCE, MASS.

FILTERS, SUPER CALENDERS, GLASSINE CALENDERS, PLATERS, DUSTERS, BRUSHING ENGINES

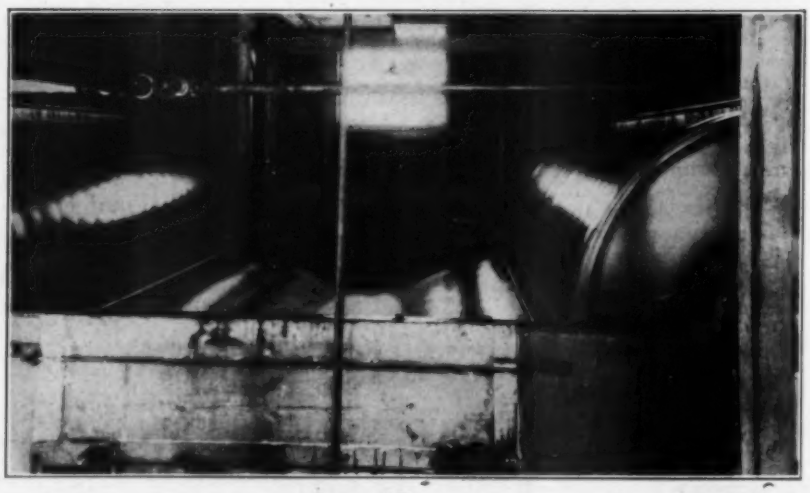
The North Rod Mill



Designed Especially for Paper and Pulp Mill Work

Makes Your Screenings into Valuable Pulp
Does Better Work Than a Beater at One-fifth the Horse Power
Positive Screw Feed, Assuring Positive Quality. No Attendant

The North Water Filter



The cut at the left is 20,000,000 gallon outfit for Northern Paper Mills. We have one 100,000,000 gallon installation and over 1,000 smaller jobs.

THREE SIZES

Save-Alls **Stone Bed Plates**

See Page 347 in the 1926 Paper and Pulp Catalogue

GREEN BAY FOUNDRY AND MACHINE WORKS

GREEN BAY, WISCONSIN

of the outstanding shares. In order to finance the purchase of the additional Northeastern stock, the directors of St. Regis have authorized the issuance of subscription warrants to all common stockholders of May 31, 1927, entitling the bearer to subscribe to common stock of the St. Regis at $45 a share, in the ratio of seven shares for each ten shares held.

West End Case Settled

The case of the West End Paper Co., Carthage, against Ben and Lois C. Levison, New York, was settled in supreme court for $9,500.

The West End Co. sued to recover $17,622 for alleged breach of contract to supply 2,563 cords of Canadian pulpwood. It charged that the wood was not delivered because it was covered by so many liens that it was impossible to get it out of Canada.

George W. Knowlton Officiates

George W. Knowlton, veteran president of Knowlton Bros., Co., had a red letter day June 2, when he officiated at the laying of the corner stone of the Jefferson County Orphan Asylum.

For many years he has served as president of the board of trustees of the orphanage, and in spite of his eighty some years he devotes considerable of his time to the management of the orphanage.

The 40,000 volt transformer of the Champion Paper Co., was struck by lightning on the morning of May 31, and completely destroyed. Lightning arresters prevented the damage from spreading to the mill. It was necessary, however, to shut down the ground wood plant for several days.

John L. Golden, for many years salesman for the Continental Bag Co., died at his home in Syracuse recently. His death was due to injuries sustained in an automobile accident over a year ago.

Standard Wall Paper Merger

Through the unanimous agreement of the stockholders the way the merger of the Standard Wall Paper Co., of Hudson Falls, and its sudsidiaries is now ready to be entered upon. The merger is expected to be under the title of the United Wall Paper Factories, Inc.

The Hudson Falls mill will be represented on the official board by Winfield A. Huppuch as president of the board and Charles W. Kellogg, treasurer of the Standard Co., as treasurer of the new concern.

Changes in Union By-Laws

A number of changes in the union by-laws are announced as the result of a referendum just completed. The proposition to increase the salary of the secretary of the brotherhood from $3,000 to $4,000 was lost by four votes.

The resolution suspending the operation of the strike fund was carried.

Other resolutions which were carried are as follows: Modifying the present law admitting to membership in the union, persons having the status of strike breaker; clarifying the death benefit fund; setting up an educational program; increasing the per capita tax from 70 cents to $1.00; members engaged in putting on wire other than on their regular tour shall receive not less than six hours' pay; no local shall authorize the issuance of any traveling or withdrawal card to a member indicating that such person has worked on any position higher than actually held; increasing the fee for depositing withdrawal cards from $1.00 to $2.00; increasing the salary of the treasurer of the union from $250 to $500 a year; placing the organization on record as favoring the five day week; adding New Years to the list of legal holidays, and candidates for the office of the vice presidency must specify the office which they seek.

David Varney, assistant engineer of the Iroquois Pulp and Paper Co., Thomson, was instantly killed when struck by a

Dilts-

HISTORY!

One mill on tissue whose largest monthly record was 133 tons (including three Sunday runnings) had *one* of their beaters rebuilt to the Dilts NEW TYPE and made 156 tons the next month without running Sundays.

Read this mill's letter:

"We expect within a short time we will also have you rebuild our other beater. We are quite satisfied with the results obtained on the first one you rebuilt for us. We find on one grade where our previous tonnage was 10,500 lbs. that we now get 14,500 lbs., due, of course, to an increase in the capacity and also the beating time.

"Ignoring entirely this good increase in tonnage we find that the beater handles the stock much faster. It also delivers the stock to the machine in a far more satisfactory condition than the old beater, and this will allow us to run at greater speeds on our paper."

Many mills have similar histories because many beaters are being built over to the Dilts common-sense NEW TYPE.

You should investigate the many Dilts rebuilding jobs and new installations. You should have the best beaters obtainable because "Your paper is made in your beaters."

Dilts
MACHINE WORKS, Inc. FULTON, N.Y.
EXPORT OFFICE - 15 PARK ROW - NEW YORK CITY

MURRAY IRON WORKS COMPANY

(INCORPORATED 1870)

BURLINGTON, IOWA

Successful Builders for 56 Years

of BOILERS *and* ENGINES

PLEASE SEND US YOUR INQUIRIES

Engines	*Boilers*
CORLISS	INTERNAL - FURNACE
PUMPING	TUBULAR
UNA-FLOW	WATER-TUBE

Our Engine and Boiler Shops are quite independent of each other. ¶ And we Specialize on Boilers the same as we Specialize on Engines.

For Permanency of Installation

POWELL VALVES

Are Foremost

Fig. 462
All-Iron Pilot
Gate Valve
Sizes 1/4 to 3 inch

All working parts of Pilot Gate Valves, when specified, are obtainable cast in iron with steel stem.

Stem is furnished with long acme thread, the same as used on all Powell Valves.

Discs are made with ball and socket back and self-adjusting to seating surfaces.

Body and Bonnet are firmly bolted together.

Reliable dealers everywhere stock Powell Valves.

THE WM. POWELL CO.
2521-2531 Spring Grove Avenue
Cincinnati, Ohio

Sirocco

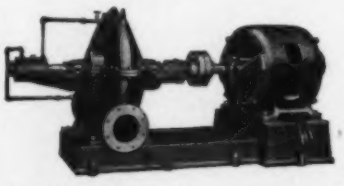
Hood Systems and Heat Economizers, Heating, Ventilating, Air Conditioning and Vapor Absorption Equipment.
Descriptive Bulletins on Request

DRYING SYSTEMS INC.
1800 FOSTER AVE.
CHICAGO, U.S.A.
NEW YORK · DETROIT · ATLANTA · CLEVELAND · SAN FRANCISCO

Quaker Water Hose for Paper Mills

We make a water hose specially to fill the requirements of the paper industry.
Quaker Paper Mill Hose is made with a tough cover to resist wear, and a tube of exceptional quality.
Can be furnished with tapered rubber nozzle for close work on the screens.
Made in ¾" and larger sizes.

QUAKER CITY RUBBER CO.
Manufacturers of Daniel's P. P. P. Rod Packing
Main offices and factories
WISSINOMING, PHILADELPHIA
Branches: New York - Chicago - Pittsburgh - San Francisco



High Efficiency Centrifugal Pumps

We build the latest improved types for every pumping requirement in paper and pulp mills.

Write for Catalog

Lawrence Pump & Engine Co.
P. O. Box 70B LAWRENCE, MASS.

MAGIC BOILER PRESERVATIVE

"The Pioneer Boiler Treatment"

Positively removes and prevents scale, stops minor leaks, pitting and corrosion

GARRATT-CALLAHAN CO.
310 South Michigan Avenue, Chicago

148-156 Spear St.
San Francisco

MAGIC
ESTABLISHED 1904

1328 Broadway
New York City

broken belt which operated a grinding machine. He was employed at the mill for the past 15 years.

Coming Conferences

Arrangements have been made for a general Northern New York conference of paper makers to be held in Ogdensburg June 12. The heads of the International Brotherhood of Paper Makers will be present.

A conference will be held soon between representatives of the International Brotherhood and representatives of the Carlisle interests to sign a wage and working agreement.

DeGrasse Mill a Pioneer

It is not generally known that Northern New York has played a most important part in the development of the pulp and paper industry on the western hemisphere—more so than any other district. Perhaps no region records more pioneering in the history of the industry than the so-called North Country.

The DeGrasse Paper Co., of Pyrites, which recently passed into the hands of International Paper Co., is one of those pioneers, for it was the first in the United States to adopt the use of iron pyrites in the manufacture of acid used in the making of sulphite pulp. Although mills in Europe had for some time been in the habit of utilizing pyrites, the mills in this country consumed brimstone.

Rich deposits of pyrites in that part of St. Lawrence county where the village of Pyrites now stands, made it advisable to use this material, for about the time the mill was built by the High Falls Pulp & Paper Co., in 1892, sulphur or brimstone was exceedingly expensive. The settlement which grew up around the paper mill was known for many years as High Falls and the older residents still refer to it by that term. Special roasters or burners were devised for the purpose of releasing the sulphur dioxide used in making the acid and this system was employed for a number of years. The aroma from the roasting ovens permeated the whole countryside.

It is interesting to note that August F. Richter of Watertown, head of the Stebbins Engineering and Manufacturing Co., and one of the first employees of the Remington Paper Co.'s sulphite mill in Watertown, the first sulphite mill in Northern New York, was employed at the High Falls mill during its construction. The company was organized by Luke Usher of Potsdam in 1892, and in 1898 the Pyrites Paper Co. was formed to take the plant over. It did not prosper, and in 1903 the late James A. Outterson, then a member of assembly and one of the most prolific builders of paper mills in the east, organized the DeGrasse Paper Co. The directorate of the company was interesting in more ways than one, for its personnel included James A. Outterson and Mark S. Wilder, Carthage; Lincoln G. DeCant and Charles N. Sherman, Watertown; J. B. Lyon and G. M. Stewart, Albany; H. V. Clark, Dexter; E. A. Everett, Potsdam; E. C. Webb and J. H. McCormick, New York; N. M. Marshall, L. F. Lehr, and F. D. Kilburn, Malone. Mr. Outterson was made president of the company which controlled the plant until 1911 when the Pulitzers purchased it to supply paper to the New York World.

There was the spectacular figure L. G. DeCant, who felt superstitious about having 13 members on the board, and the point was raised, with lots drawn to see who would withdraw. Mr. Webb drew the unlucky number, and withdrew. Mr. DeCant, who died in California only a few years ago, devoted much of his early life to the circus business and for several years was an owner of one.

John A. Remington has resigned as manager of the Oswegatchie Paper Co., at Natural Dam. He had been manager of the mill since its reorganization four years ago.

Rain leaking through the roof of the West End Paper Co., Carthage, caused a short circuit in the main line switches and started a fire which caused damage amounting to about $1,000.

The Dexter Sulphite Pulp and Paper Co., has sold its Monteola hardwood mills at Glenfield to the Keystone Wood

Strength to spare!

Fig. 325
Screwed, Jenkins Standard Iron Body Gate Valve

Each genuine Jenkins Valve is made with strength to spare. Each, before it leaves the Jenkins factory, must pass a test which provides for a wide margin of safety.

Strength to spare is the reason a Jenkins gives *service* to spare—long term, low cost service which puts an end to frequent repairs and replacements.

Strength to spare has been a part of the Jenkins manufacturing policy for over 60 years. It has been a factor in winning and holding the friendships of engineers by the hundred.

There are genuine Jenkins Valves for practically every requirement of the paper industry.

At supply houses everywhere.

JENKINS BROS.

80 White Street .....New York, N. Y.
524 Atlantic Avenue .....Boston, Mass.
133 No. Seventh Street....Philadelphia, Pa.
646 Washington Boulevard.....Chicago, Ill.

JENKINS BROS., Limited
Montreal, Canada London, England

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

VALVE MAKERS FOR OVER FIFTY YEARS

THE first commercially successful pressure regulator was the Davis. Its basic design of fifty years ago has met all of the tests. It eliminated the spring, and balanced steam pressure by a weighted lever, allowing visible action and hand testing. Davis pressure regulators are still giving the high type of dependable service which gained instant acceptance for them over a half century ago.

The Davis Pressure Regulator is dependable because it is mechanically simple. Pressure balanced by weight—not by springs which may deteriorate. An oil dash pot gives steady service without chattering. And the lever makes its action visible—you can test it by hand.

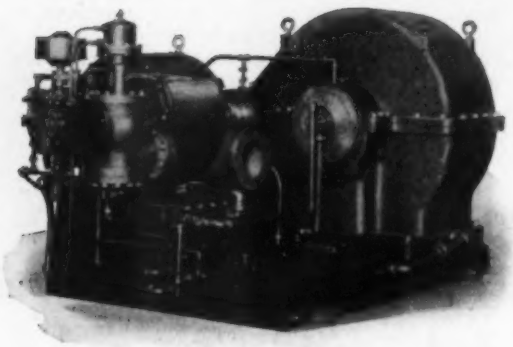
DAVIS VALVE SPECIALTIES
STEAM-SAVERS SINCE 1875
G. M. DAVIS REGULATOR CO. 421 Milwaukee Avenue, Chicago, Ill.

PI6-Gray

MOORE

"Best at every turn"

PAPER MACHINE DRIVES INCREASE PRODUCTION



One of two paper machine drives furnished to a large Canadian mill.

Outstanding Features

Constant or Variable Speed
Minimum Floor Space
Low Maintenance Costs
Clean Exhaust Steam
Simple—Reliable
Ease of Control
Higher Paper Machine Speeds
Due to Stable Governing

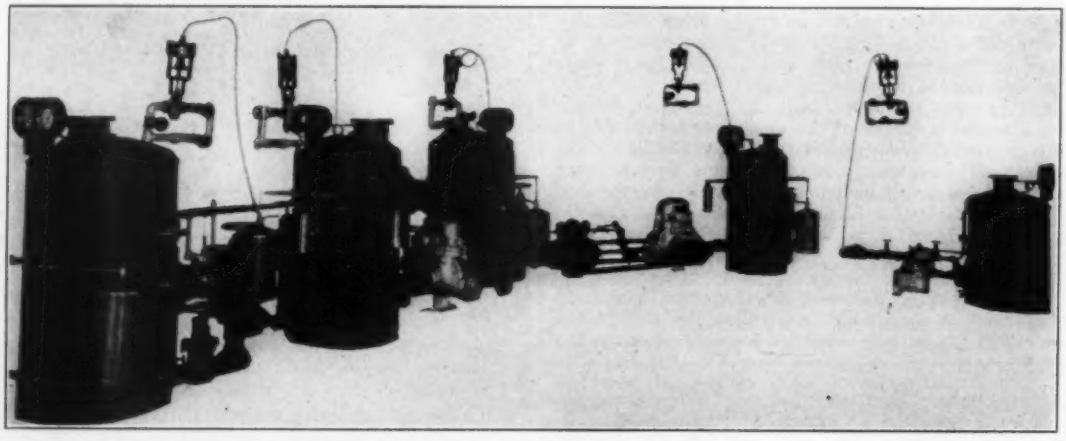
Literature upon request

Steam Turbines **Centrifugal Pumps**
Reduction Gears

Offices in all principal cities

MOORE STEAM TURBINE CORPORATION
WELLSVILLE, NEW YORK

In Canada
Ontario and East — General Supply Co. of Canada, Ltd., Ottawa
Manitoba and West — Darling Bros., Ltd., Montreal



One Shipment

Increased drying efficiency is being secured in paper mills throughout the country with the improved Fulton dryer drainage System. The picture shows five Fulton Circulators ready for shipment. Your drying can be improved by our practical experienced paper mill engineers.

Better sheet—More production—Lower cost

Fulton Engineering Co., Middletown, Ohio

and Chemical Co., of Glean. The new owners will use the best of the hardwood for lumber, while the culls and refuse will be used to manufacture chemicals.

The Ogdensburg Pulpwood Co., has been authorized by the secretary of state to reduce its capitalization from $40,000 to $30,000.

NEW YORK CITY NEWS

Paper Stock Dealers Organize

A start toward concerted co-operation in the waste paper trade of New York City was made at an initial meeting held in the Broadway Central Hotel on April 28 which was attended by a score or more of the leading packers of this commodity in this city. The meeting was presided over by Morris Kay, of the Sterling Mill Supply Co., Inc., and after considerable discussion of the various problems confronting the old paper trade, it was decided to organize a new association, which was thereupon effected.

The new body is called the Waste Material Merchants' Association of New York, Inc., and Mr. Kay is chairman, and Joseph V. Carrano, of James Carrano's Sons, is secretary and treasurer. The purposes of the association are to provide an instrument for general co-operation among waste paper interests in New York and vicinity, and to devise ways and means of bettering trade and marketing conditions in waste paper, of improving the quality of the waste paper packed in this city, and of creating a more cordial spirit in transactions between waste paper dealers and the mills consuming this commodity.

Since the organization of the new association, weekly meetings have been held at the Broadway Central Hotel, and steps have been taken toward improving the quality of waste paper packed in this center, with a view of inducing box board manufacturers and other consumers to do more of their buying in this city. The organization numbers among its membership some of the most prominent packers and dealers in New York, and a sincere effort is being made toward co-operation between the members and with the board and paper mills using waste paper.

The American Tissue Mills, of Holyoke, Mass., have opened an office in New York City, in Room 2264 of the Woolworth Building, in charge of C. B. Brown. A large and complete stock of samples of textile and velvo crepe papers, white and colored fourdrinier tissues, plain and decorative crepe papers and napkins, plain and printed waxed papers, and sanigenic waxed lunch rolls and bread wrappers is maintained at this office.

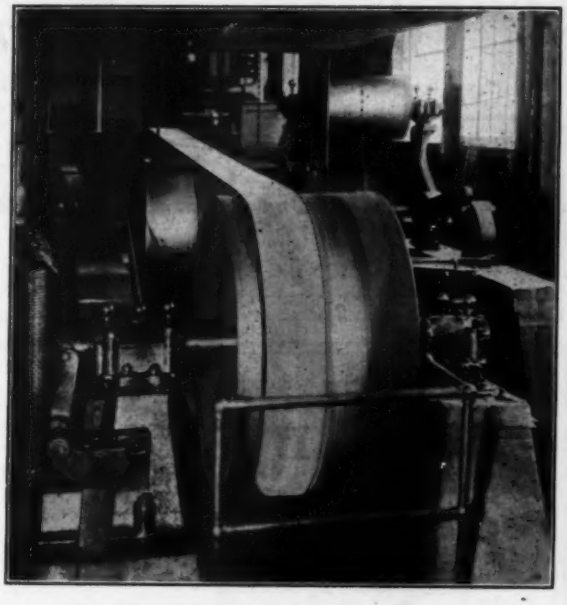
The eastern sales offices of the Howard Paper Co., the Aetna Paper Co., and the Maxwell Paper Co., have been removed from 280 Broadway to a suite in the new Court Square Building at 2 Lafayette street, New York. William H. Clark, eastern sales manager, is in charge of the offices, assisted by Howard R. Miller, associate manager.

I. P. Appointments

John H. Hinman has been appointed manager of the Woodlands Department of the International Paper Co., with headquarters in the local or principal offices of the company at 100 East Forty-second street, New York. Mr. Hinman has been connected with the I. P. company since 1917 and his duties have been continuously with the timber land operations of the company.

Another announcement concerning the personnel of the International Paper Co., is the appointment of F. B. Chapman as assistant manager of the Purchasing Department. Mr. Chapman has been promoted from agent of the Three Rivers Mill of the I. P. to his new position, where he will assist George E. Smith, in charge of the Purchasing Department with headquarters in the New York offices. Mr. Chapman has been with the company since its organization in 1898, and has spent all of his business career in the paper

RHOADS TANNATE BELTING



A Report on Belt Costs

HERE are the principal facts of a recent report on a Rhoads Tannate Leather Belt furnished a Wisconsin paper company in April 1923.

DATA:—Heavy double; 40 feet long; one ply 12 inches, the other 10 inches; the wide ply next the pulleys. It is the cone drive of a paper machine 176 inches wide, with capacity of 60 tons daily. Distance between centers 13 feet. Belt speed 3400 F. P. M.

HISTORY:—Belt in constant use for four years, and on April 15, 1927, was still running in fair condition. It may last for months yet. It has been taken up only twice; the last time was about a year ago. The price paid was $324.72.

RUBBER BELTS COST MORE

Previous to the Tannate, two rubber belts were used on this drive; a 12-inch 8-ply next the pulleys and a 10-inch 6-ply on top of this. On an average this pair of belts cost $182. One of these belts had to be replaced about every three months; making a belt cost of $182, every six months.

NOTE THIS FURTHER SAVING

The Tannate has been running four years, an 8 to 1 record. Had they continued using rubber, the cost would have been $1456 for the four years; against the Tannate cost of $325—a Tannate saving of $1131 on purchase cost alone. The rubber gave much trouble with hooks tearing out, with frequent takeups on account of stretch, plus the cost of putting on the seven pairs of belts. We may therefore safely figure five hours working time lost per year. At $50 per hour, a very safe estimate, this gives us an added loss of $1000 due to the rubber belts. Their mechanical engineer says that the above figures for shut-downs are, if anything, too low.

It pays to use Rhoads Tannate Leather Belting.

J. E. RHOADS & SONS

PHILADELPHIA.....47 North Sixth Street
NEW YORK.....112 Beekman Street
CHICAGO.....334 West Randolph Street
ATLANTA.....80 South Forsyth Street
CLEVELAND.....1234 West Ninth Street

Factory and Tannery: Wilmington, Del.

Morey Paper Mill Supply Co.

Vulcan TRADE MARK

99 CHAUNCY St. BOSTON, MASS.

Sole Selling Agents

Brandon "TRI-UMPH" 3-Ply Dryer Felts

Up to 245" in Width

CAREFUL, INTELLIGENT, QUICK SERVICE

SCREEN PLATES *and* DANDY ROLLS

Watermarking a Specialty

Central Manufacturing Co.

The Quick Service House

KALAMAZOO MICHIGAN

Remember

WM. A. HARDY & SONS

FITCHBURG, MASS.

Originators and Oldest Manufacturers of the

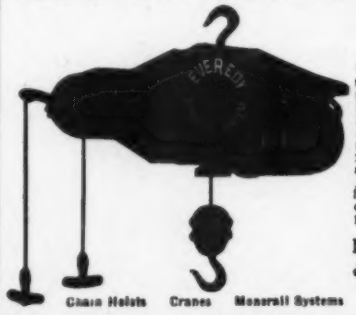
Cast Bronze Screen Plate

ALSO SPECIALIZE IN

Acid Resisting Digester Parts

500 lb. Electric Hoist

$225.00



This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 85 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

READING CHAIN & BLOCK CORP.

READING, PA.

UNION SCREEN PLATE CO.

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

Union Bronze Screen Plates

(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge

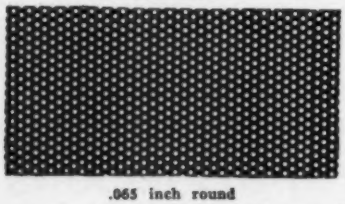
UNION BRONZE SCREWS for Screen Plates

Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

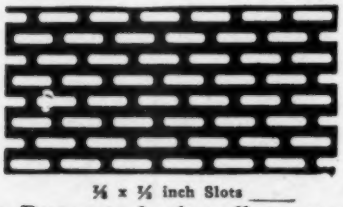
The Witham Screen Plate Fastener, Patented

THE ORIGINAL THE BEST

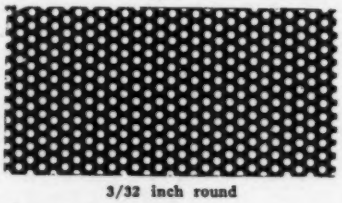
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



¾ x ⅛ inch Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS, 57-65 Fairmount Ave., Jersey City, N. J.

industry, starting with the Fort Edward Mill in Fort Edward, N. Y., when that mill was owned by the Glens Falls Paper Co., which was absorbed by the International Paper Co.

The Byron Weston Co., manufacturer of Dalton, Mass., will shortly open a sales office in New York City, to be in charge of F. H. L. Bridal, formerly of the Chicago office, who has been here arranging for the new office, according to announcement made recently.

A feature in the observance of National Forest Week during the last week of April was an interesting and instructive talk over the air given on the evening of April 28 through Station WEAF in New York by Royal S. Kellogg, secretary of the News Print Service Bureau, on the subject of "Our American Forests."

A new company under the name of the A. & H. Paper Mills Supplies Co., at 15 Beekman street, New York, has been organized by Gus R. Holm, formerly with Sol Ash, Inc., of this city. The new firm will handle all grades of papermaking material, specializing in waste paper. Associated with the new concern is Ira L. Beebe, Jr., widely known in the papermaking industry as a supplier of wood pulp, chemicals and other supplies to paper mills, as well as a mill agent for the sale of paper and paper products.

Dwyer Brothers, of Trenton, N. J., have been incorporated with a capital of $100,000 under New Jersey laws to deal in writing papers, stationery, etc. The incorporators were James W. and Edward T. Dwyer, of 127 North Broad street, Trenton.

Standardized Binders Board

O. M. Porter, assistant secretary of the American Paper and Pulp Association, reports definite progress toward standardization in the Binders Board industry. The manufacturers of binders board are recommending the establishment of five stock sizes, the larger consumers, represented by the bookbinders and publishers, would increase the number of stock sizes to ten. Mr. Porter reports prospects of complete accord in this matter and official recognition of these stock sizes by the Department of Commerce in the near future.

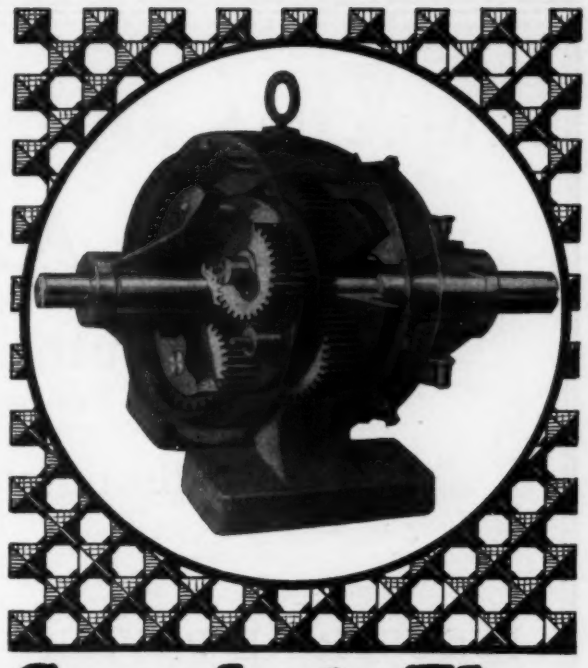
The following members of the Binders Board Manufacturers' Association attended a regular meeting of the association held in the offices of the Consolidated Paper Company, at Monroe, Mich., May 27: E. C. Betz, Consolidated Paper Company; John A. Dodd, The Davey Company; E. Davey Dodd, The Davey Company; Edward Kerr, Jr., Kerr Paper Mill Company; E. H. Norton, C. H. Norton Company; H. V. Daub, Otter River Board Company; A. B. Goodrich, Riverside Paper Manufacturing Company; H. McDaniel, Waldorf Paper Products Company; O. M. Porter, secretary Binders Board Manufacturers Association.

C. W. Boyce Wins Fellowship

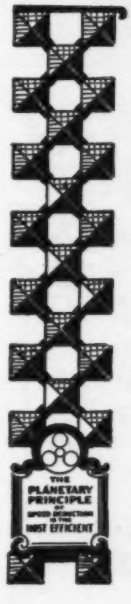
Charles W. Boyce, of the Untied States Forest Service, has been awarded a fellowship for study at Yale University. The paper industry knows Mr. Boyce as co-author of the government's bulletin on "How the United States Can Meet Its Present and Future Pulpwood Requirements."

Mr. Boyce, in his official capacity as examiner in charge of the Forest Service work in forest economics, including the pulp and paper and lumber industries, has co-operated very closely with the Woodlands Section of the American Paper and Pulp Association and also with the Technical Association of the Pulp and Paper Industry. He is a graduate of the Forest School of the University of Michigan and has recently received a Master's degree from American University in geography and economics.

The Joint Committee on Approved Pulp Testing Chemists for the paper industry of the United States has recently approved for listing Mr. A. Osgyani, of the Raymond G. Osborne Laboratories, Los Angeles, Cal.



Somebody Else- not Ganschow



builds speed transformers for buyers of price. Ganschow Products never have been and never will be built just to be "good enough".

BECAUSE

the best materials and engineering skill cost more and that's what you get from Ganschow—Forged Steel Driving Plates—semi-steel housings—gears hardened thruout and shafts fully ground—driving studs hardened and ground—Hyatt heavy duty roller bearings on high speed end of all drives over 10 H. P.—three internal bearings to take up all weight and torque.

Materials such as these, designed and assembled to give the greatest reduction in the least space over the longest period, are *worth more.*

We repeat. We can't sell at a lower initial cost but we do manufacture speed transformers at a lower year in and year out cost. Catalogue 111 shows you why "there is a difference". Write for your copy.

William Ganschow Company

1015 W. Washington Blvd. Chicago

OFFICES IN PRINCIPAL CITIES

Original Designers and Patentees of the Right Angle Drive

GANSCHOW

SPEED TRANSFORMERS CUT GEARING

KARL A. LEFREN

Consulting Engineer

Member A. S. M. E.

171 Madison Ave., New York City

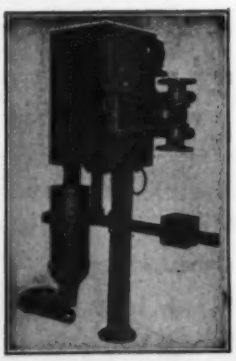
INDUSTRIAL POWER
PAPER AND BOARD MILLS
MILL CONSTRUCTIONS

REPORTS
DESIGNS
CONSTRUCTION

DON'T WORRY OVER WEIGHTS!

Write to TRIMBEY

Used Wherever Paper is Made



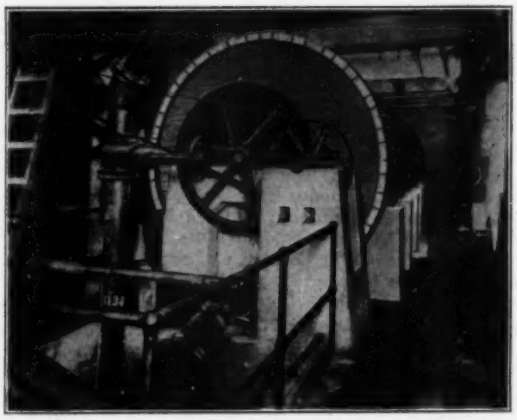
More than 650 In Operation

"Made in Canada"

Agencies in Principal European Countries

TRIMBEY MACHINE WKS.

Glens Falls, N. Y.



Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.

CINCINNATI, OHIO

OHIO NEWS

Mills Respond to Flood Crisis

The paper mill group was unusually active in contributing cash and other donations for the flood sufferers in the south. Mill men in Franklin, Dayton, Middletown, Excello, Lockland and Hamilton in addition to contributing cash donations, arranged for the first shipment of blankets to the flood area to be used by refugees thrown out of homes. These blankets were quickly collected at the paper mills and sewed by volunteer workers, mostly women and girls, in the various localities. Then they were taken to a central point and shipped to the south.

Later, shipments of merchandise, food and clothing from Middletown were made by the Pennsylvania R. R. free of charge, who donated a car. The Fairbanks Box Co. and the John Ross Co. donated the boxes in which the goods were shipped. The Gardner-Harvey Paper Co. contributed valuable service.

Industrial Exposition in Middletown

Paper manufacturers took an active part in the industrial exposition given by the Elks June 13-18 in connection with the celebration of "Progress Week" by the merchants and manufacturers.

One of the features of the exposition was the manner in which methods and processes used in the manufacture of the various products of the "Paper City" which have become known throughout the world.

Elaborate plans were made for a dinner to Senator David De Armond and Representative William Goodwin of Butler County for their splendid efforts in securing passage of the bill providing for the abandonment of the Miami & Erie Canal from Middletown to a point near Cincinnati. Those in attendance were members of the Bureau of Trade and Commerce and the Civic Association.

Miami Valley suffered considerably when a destructive cyclone passed through the territory causing considerable damage to property both industrial and residential. At Miamisburg the heavy smoke stack at the twine mills was blown down and crashed through the roof of the power house.

Employees of the Advance Bag Co., Middletown, were greatly alarmed recently when they found a real lion sleeping under a wagon on the factory lot. "Leo" had escaped from a cage at a circus and caused considerable excitement until his trainers arrived and lassoed him, and led him back to his cage.

Downward Trend in Accidents

The downward trend in industrial accidents again was shown the past month in the number of casualties reported to the State Industrial Commission. Total number was 18,461, which was 704 less than the previous month, while 653,596 days lost by workmen and mill employees is nearly 80,000 less than last month and nearly 36,000 less than for April, 1926.

Approximately 5,000 of the accidents were the result of machinery operations, and nearly 3,000 from handling objects, according to the report.

The National Association of Gummed Tape Manufacturers, who are affiliated with the American Paper and Pulp Association, have prepared a folder showing the proper method of sealing cartons with gummed tape. This has been prepared for use by the American Railway Express and the American Railway Association in the belief that wider dissemination of knowledge of the best methods of sealing would result in safer transportation of shipments with consequent lessened claims for damages.

An Unusual Assertion

Each and Every Darling Gate Valve of every size and type is tested for rate of pressure and inspected for flaws.

BECAUSE this factory condition is unusual we are bringing it to the attention of the manufacturers of paper.

Darling Gate Valves, in line with our policy of producing only the best in material and workmanship, must pass through six distinct inspections in the course of manufacture in addition to the final test for rate of pressure. There could be no greater effort than this expended to insure Darling Valves reaching you in perfect condition and living up to our claim of superiority.

Details of construction as well as catalog will be gladly sent upon request.

DARLING

"Makers of Valves for the Paper Industry"

DARLING VALVE & MFG. CO.

Williamsport, Pa.

New York
Chicago

Oklahoma City
Houston

DARLING
GATE VALVES

1864 1927

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

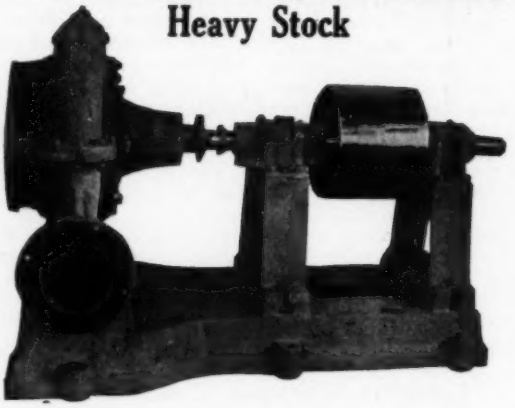
We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock



Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

LAWRENCE MACHINE COMPANY
LAWRENCE, MASS.

Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

SIMONDS

Barker and Chipper KNIVES

Tough steel of edge-holding quality, backed by expert workmanship, makes Simonds Knives the most serviceable for pulp and paper mills.

Write for Catalog and Prices

See page 393 in the 1926 Paper and Pulp Mill Catalog

SIMONDS SAW AND STEEL CO.
Established 1832 FITCHBURG, MASS.
Boston, Mass. Chicago, Ill.

RECOMMENDED BY BELTING MANUFACTURERS

CRESCENT
BELT FASTENERS

Write for Catalog

CRESCENT BELT FASTENER CO., 247 PARK AVE., N. Y. C.

WISCONSIN NEWS

Sale of the Peshtigo Paper Co., Peshtigo, Wis., has been postponed to August 1. Full-time production has been going on at the plant since the appointment of P. M. Allen, Detroit, as receiver. Prospects for the future seem favorable.

The hydro-electric plant of the Northern Electric Co. at Chalk Hills has been completed. The companion product at White Rapids is still under construction. Northern Paper Mill interests of Green Bay are promoting the power company, and these dams when completed will mean more economical power.

Nearly fifty years of operation for the Fox River Paper Co., Appleton, are being completed. The company started in 1883 with four tons daily, and is now having an output of fifty tons per day.

Lawrence E. Nash

Nervous collapse following an attack of influenza is said to be responsible for the death of Lawrence E. Nash, until recently vice-president of the Nekoosa-Edwards Paper Co. He held many offices of responsibility during his twenty-five years in the paper industry, and before coming to Port Edwards was with the General Paper Co., of Chicago.

An important decision which will benefit Wisconsin paper mills was handed down by the State Supreme Court in an appealed case previously won by the Nekoosa-Edwards Paper Co., the Marathon Paper Mills Co., Wausau Sulphite Fibre Co. and the Consolidated Water Power and Paper Co. The defendant was the Wisconsin Railroad Commission. Under the decision paper mills are permitted to make arrangements with railroads for switching by mills in their yards, at a rate to be agreed upon between paper mills and railways.

F. J. Sensenbrenner, vice-president and general manager of the Kimberly-Clark Co., Neenah, was honored on May 10 by the order of St. Gregory the Great, which is the highest honor that can come to a Catholic layman.

Pulp shipments by boat from Canada for the Consolidated Water Power and Paper Company's mills in Wisconsin have begun on Lake Superior. The first cargo consisted of 25,000 tons.

A small fire, with damage not exceeding $1000, occurred in the Dells Paper and Pulp Co., of Eau Claire, Wis.

Menasha Paper Mills, successors to the Island Paper Co., are now manufacturing strawboard. Several baling machines have been installed and are now in operation.

Change of name from Kimlark Rug Co. to Kimlark Rug Corp., a subsidiary of Kimberly-Clark Co., at Neenah, and an increase in stock up to 1,200 shares of no par value, were authorized by amendment to the articles of incorporation.

J. Leslie Sensenbrenner of Kimberly-Clark Co., Neenah, has been made manager of the company's mill at Niagara Falls, N. Y., to succeed S. R. Stilp.

William R. Smith, president of the International Brotherhood of Paper Makers, and Congressman George J. Schneider, international vice-president, recently conferred on labor conditions in the Wisconsin paper industry.

The wood room of the Kimberly-Clark Niagara, Wis. mill recently celebrated its record of perfect safety since March 7, 1924. The employees had put in 125,000 man days of safety,

Speed Up Your Shop Production with Wood-Fafnir Double Ball Bearing Boxes!

ADD more horsepower to your machinery with Wood-Fafnir Ball Bearing Hanger Boxes, designed with two sets of ball bearings running in hardened alloy steel rings.

They will reduce your line shafting friction almost to zero and eliminate shafting wear entirely.

Wood-Fafnir Ball Bearing Units require lubrication only 2 or 3 times a year. The bearings are sealed. Dust can't get in—oil can't get out.

They assure maximum power to your machinery and minimum maintenance costs. In fact, the savings effected by their use pay their cost many times over.

Write for Descriptive Circular

T. B. WOOD'S SONS COMPANY

"Makers of Power Transmission Machinery since 1857"

CHAMBERSBURG PENNSYLVANIA

SEVENTY YEARS SERVICE 1857 W 1927

FOR ALL PAPERS—

A Fitchburg Felt

¶For whatever paper you make, whether fine ledger or bond, book or coarse paper, Fitchburg Felts give long and efficient service.

¶Fitchburg Cotton Dryer Felts are made in two, three, four, five and six ply in English weave, from 60 to 210 inches in width.

¶When next thinking of dryer felts, think of "Fitchburg."

FITCHBURG DUCK MILLS
ESTABLISHED 1844
54 Duck Mill Road FITCHBURG, MASS.

Exclusive Makers of
Paper Makers' Felts

Lockport Felts

HAVE YOU RUN THEM?
IF NOT—WHY NOT?

Are you interested in accurate running felts?

GIVE US A TRIAL
Get Authentic Information
Ask the men who run them

Yours for service
LOCKPORT FELT COMPANY
NEWFANE, NEW YORK

THE WATERBURY FELT CO.
SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

KNOW THE BEST FROM THE REST

KNOW
Our Product Is the Best.
Proved by Test from Coast to Coast

Stowe & Woodward Company

Newton Upper Falls, Mass. *The Rubber Roll Makers*

and cash awards were made to the winners for the fourth time.

$47,000 first mortgage bonds have been called in by the Tomahawk Pulp and Paper Co., Tomahawk, Wis., for redemption June 1.

Bergstrom Paper Co., Neenah, has taken up group insurance for its employees, the minimum of which is $1,000.

Edgewater Paper Co., of Menasha. Wis., has increased its capital stock from $50,000 to $100,000.

Kimberly-Clark Co. is building a new groundwood mill at Kimberly. The foundation has already been completed.

MICHIGAN NEWS

Local Firm Sues

A patent infringement case of the Sutherland Paper Co., against the International Paper Box Machinery Co., of New Hampshire, reached the federal court in Cincinnati.

Fred Sutherland, secretary of the Kalamazoo concern, explains the case as a purely technical one to establish claim to a device, patents for which are purported to be held by the Sutherland Paper Co. There are no damages involved. The Menasha, Wis., Printing Co., is allied with the local firm in the suit.

Bradford Stockholders Lose

On a final inventory and accounting of the assets of the Bradford Paper Co., the stockholders will not receive ten to fifteen cents on the dollar as originally thought.

After the complete audits of the books, the Bradford Co., has barely enough assets to cover the liabilities involved.

Superintendents Hold Last Yearly Meeting

The Michigan Division of the Superintendents' Association held their last meeting for the year on May 19. At this meeting, Edward Rutz, superintendent of power and maintenance at the Bryant Paper Co., spoke on "Co-operation with the Power Department."

His very interesting talk was well received, and he brought out some very fine points often overlooked by the superintendent in charge of production from the paper machines.

Sherman Woodward, master mechanic of the Allied Mills, Monarch Division had a serious accident recently, but has recovered sufficiently to be back on the job again.

George H. Pountain Resigns

George H. Pountain, for ten years connected with the Monarch and Allied Paper Mills, has resigned effective June 1, 1927.

He was first general superintendent of the Monarch Paper Co., later King Division of the Allied, and general superintendent for the last two and a half years of the King Division. He plans on taking a short vacation before resuming work with other connections.

F. D. Swigart, president of the Swigart Paper Co., Chicago, is one of the founders of the new Congress Trust and Savings Bank of Chicago which has just opened. This bank is to serve the new interests created by the erection of the new Stevens Hotel, said to be the largest hotel in the world, and E. J. Stevens, builder of the hotel, is also one of the founders of this bank.

Berwin Paper Corp., Dansville, N. Y., reports a fine party tendered H. T. Kehew, treasurer of the company, who left for a two months European trip, which will include attendance at the World Convention of Rotarians at Ostend, Belgium.

Pioneers in Paper Making

BELIEVING it will interest our friends to know something of the pioneer paper makers of America, brief notes of the earliest paper mills in different parts of the country will be recorded below from month to month.

THE PIONEER MILL OF THE BERKSHIRES

No section of the United States enjoys a higher reputation for fine paper making than Berkshire County, Massachusetts. The humble beginnings of the industry in this locality were made when Zenas Crane, Henry Wiswall and Daniel Gilbert established a small one-vat mill at Dalton in 1801. The late Hon. Byron Weston is responsible for the statement that the output of the mill until 1807 was about twenty tons per annum.

Crane sold out his share in the pioneer mill in 1807 but continued his activities as a paper maker with notable success, and the business which he established is continued by his descendants in the well known firm of Crane and Company.

Established 1842

Cheney Bigelow Wire Works

Experienced and Progressive

Fourdrinier and Cylinder Wires
Dandy Rolls and Cylinder Moulds
made and recovered

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CYLINDER PAPER MACHINES

One 5 cylinder machine, 26 dryers, trim 67"
One 4 cylinder machine, 32 dryers, trim 83"
One 4 cylinder machine, 24 dryers, trim 84"
One 6 cylinder machine, 80 dryers, trim 93"
One 6 cylinder machine, 44 dryers, trim 96"
One 6 cylinder machine, 90 dryers, trim 100". (New)

If you want a cylinder machine, you can make a selection from the cylinder machines we have to offer.

Gibbs-Brower Co., Inc.

Paper and Pulp Mill Brokers
261 Broadway, New York City 166 W. Jackson St., Chicago
Our Motto: "SERVICE FIRST"

FOR SALE—Second-hand 1200 lb. wood tub N. & W. beater. In good condition. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

WANTED—Job as Assistant or Superintendent. Thoroughly experienced on Fourdrinier on light grades, book, bond, catalog and wrapping. Can increase your production. A-1 on machines in beater room, sulphite, groundwood or paper stock. Can give good results. Address Box 131, The Paper Industry.

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in this
Opportunity Section

POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

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PITTSBURGH, PA.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers
RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

PAPER MACHINES FOR SALE

In good condition Immediate Delivery

One—2-cylinder machine. 2 presses; 10 dryers, 42"x84"; one calender; reel; single drum winder; marshall drive.

One Fourdrinier machine. Wire 96"x50'. 2 presses; 15 dryers, 48"x94"; one calender; reel; two drum winder; marshall drive.

By:
FRANK H. DAVIS COMPANY
175 Richdale Avenue, Cambridge, Mass.

ESOTOO

Trade Mark Reg. U. S. Pat. Off.

LIQUID SULPHUR DIOXIDE

In Tank Cars

Will Enable You to Maintain Uniform Sulphite Liquors

as an **Antichlor**

for bleached pulp it has no equal

VIRGINIA SMELTING CO.

Works: West Norfolk, Va. F. A. EUSTIS, Secretary
C. W. Johnston, Manager 131 State St., Boston, Mass.

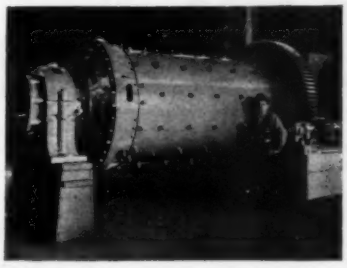
FORGE AND HAMMER WELDING
PULP DIGESTERS

BLAW KNOX COMPANY — PITTSBURGH

A Rod Mill with Conical Ends

The conical ended rod mill, "the mill that makes the rods stay put," is a recent development of the Hardinge Company of York, Pa.

The outstanding feature of this design is the conical ends, which are responsible for the alignment of the rods within the mill during the grinding process. This feature eliminates the heavy pounding on the heads, and the consequent high liner wear. The large space in front of the rods facilitates access of feed to the whole mass of rods, and, likewise the space at the discharge end, increases the discharge rate, as there is no obstruction from the rod ends to hinder free flow of the product.



A variable discharge level is provided for by discharge ports, which can be opened or closed to suit the particular problem.

When grinding dry to a coarse or granular product, this mill will handle a feed with more moisture than any other type of pulverizer.

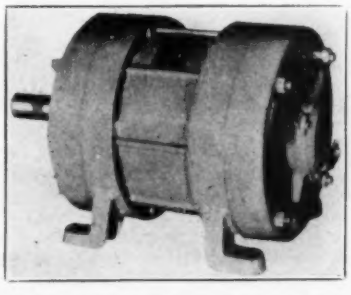
Paper mills are finding the rod mill an improvement over old methods for producing a properly beaten stock for paper machines. The shredding action of the rods maintains the long fibres and the operation is accomplished with less power and lower maintenance costs than methods heretofore used.

The conical shape of the mill insures great structural strength, plus light weight, a decided advantage to the practical mill man.

All Steel Line of Ball Bearing Induction Motors

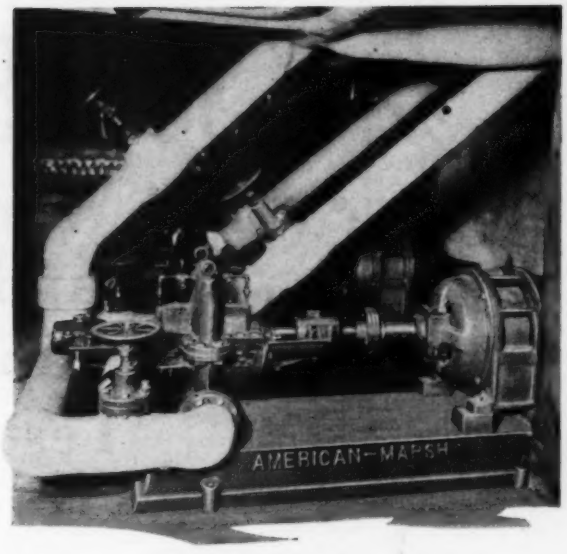
A complete line of all steel, ball bearing polyphase induction motors, ranging in size from 1 to 100 horsepower in all standard voltages and cycles, is announced by The Lincoln Electric Company of Cleveland, Ohio. This type of motor is representative of the new designs of equipment being brought out by The Lincoln Electric Company, in which gray iron and malleable castings have been entirely replaced by hot rolled steel.

It is claimed that every part of the motor is at least twice as strong as the former type which was built with a cast iron frame. An example of the increase in strength of the frame is cited in the case of the motor feet. Drop forged steel feet are welded on to the hot rolled steel end rings of the motor. This, it is claimed, eliminates a common source of difficulty with electric motors arising from the fact that cast iron feet are frequently broken off in rough handling. The end brackets or bearings supports are also made up of welded steel construction giving a complete all steel motor.



Economies in manufacturing by the new process have permitted the use of much larger shafts and bearings than is usually found on this type of equipment.

Owing to the greater strength of steel as compared with cast iron, less thickness of metal is required in the frame. It is claimed that the increased ventilation so obtained results in a considerable increase in the overload capacity of the motor, so that a continuous overload of from 10 to 50 per cent can be handled by the motors depending upon the size and speed.



Pumps for Strenuous Mill Service

AMERICAN-MARSH Centrifugal Pumps for general service in paper mills are excellently adapted to high speed, low cost motor drive—and widely used for water supply, for boiler feed, as paper stock pumps with special open type impellers, etc.

The two pumps shown above are delivering 500 gallons per minute against a total head of 65 pounds and are direct driven by General Electric motors.

The initial high efficiency of this American-Marsh equipment is protected by bronze wearing rings on *both* impeller and casing; trouble free service assured by heavy, rugged construction throughout. Both casing and bearings are horizontally split—all parts interchangeable. Built single and multi-stage—fully guaranteed and tested.

When you bring your centrifugal or steam pumping problem to us, it is in capable hands—200,000 installations—40 years' experience in satisfactorily meeting standard and special paper mill requirements. Write for Bulletins and FREE Engineering Service.

WE ALSO BUILD FOR THE PAPER MILL: Vacuum Pumps, Deep Well Engines, Ball Valve Pumps, Suction Box Pumps, Air Compressors and Special Pumping Equipment for Special Mill Applications.

AMERICAN-MARSH

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN
Sales Engineers in All of the Principal Cities

Centrifugal Pumps

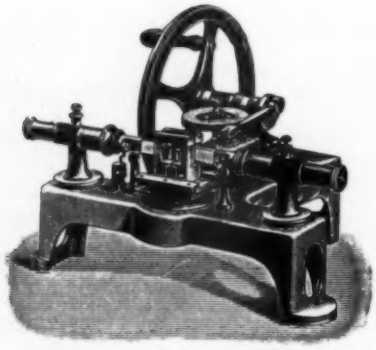
SCHOPPER

World Standard Paper Testers

No. 377—Small Piece Desk Scale
18 in. high, 12 in. wide. Gives basis weight per ream 24x36—480 and 500 sheets, by weighing small pieces, 4x4 or 2x4 in.

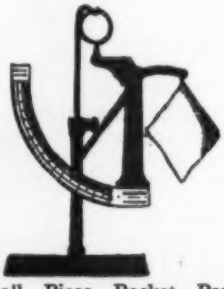
No. 367—Full Sheet Paper Scale
22 in. high, 15 in. wide. Standard scale for giving actual weight per ream. 480 and 500 sheets in size weighed. Graduated ½ lb. up to 125 lbs.

The Schopper Standard Desk Micrometer
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.

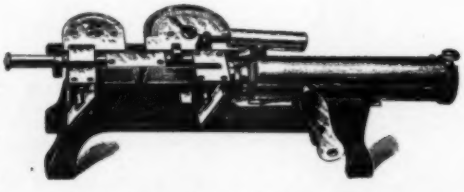


Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester



Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



Rapid Strength and Stretch Tester

FOREIGN PAPER MILLS, Inc.

Sole Agents

72 DUANE STREET, NEW YORK

Warehouses: NEW YORK—MONTREAL

Write for Booklet on Paper Testing Instruments No. I-100

Technical Developments in the Paper Industry

Domestic and Foreign

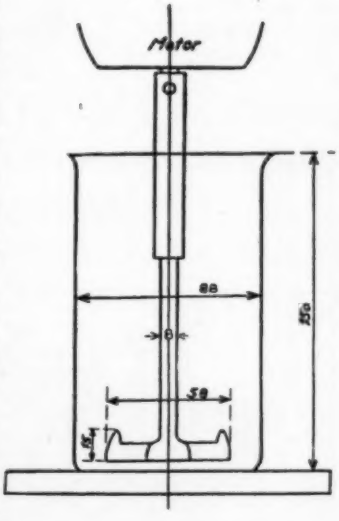
The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

New Method for Determining Degree of Beating

THE method depends on the bleachability of pulp with potassium permanganate and on the possibility of back-titrating the unused potassium permanganate by means of the following reaction:

$$2KMnO_4 + 8H_2SO_4 + 10FeSO_4 = K_2SO_4 + 2MnSO_4 + 5Fe_2(SO_4)_3 + 8H_2O.$$

The following solutions are used in carrying out this method: fiftieth normal solution of potassium permanganate, normal solution of sulphuric acid, and fiftieth normal solution of ferrous sulphate. The latter solution is prepared by dissolving approximately eight grams of ferrous ammonium sulphate in approximately 500 cubic centimeters of water with the addition of 50 cubic centimeters of concentrated sulphuric acid, then filling up to the liter mark and titrating against fiftieth normal solution of potassium permanganate.



Two grams of the finely triturated dry pulp are used, or the bleaching test, and this amount of pulp is moistened with five cubic centimeters of water, or five grams of moist stuff is pressed out between the hands so that it contains approximately sixty per cent of moisture. The pulp is placed in a beaker of 600 cubic centimeters approximate capacity, containing 150 cubic centimeters of fiftieth normal potassium permanganate solution and five cubic centimeters of normal sulphuric acid, which have been raised to the temperature of 25 degrees C. As soon as the pulp is added a stop-watch is started and exactly after thirty seconds, one hundred cubic centimeters of ferrous sulphate solution are poured into the solution from a second beaker. This reacts with all of the Potassium permanganate which has not reacted with the cellulose. The beaker in which the ferrous sulphate solution was contained is then washed out with forty cubic centimeters of water (when moist pulp is tested 42 cubic centimeters are used) and the wash water is added to the bleaching beaker. Then the stirrer, which has been set into operation within ten seconds after the beginning of the test, is stopped working.

The beaker now contains the following: 150 cubic centimeters of fiftieth normal solution of potassium permanganate, five cubic centimeters of normal solution of sulphuric acid, three or five cubic centimeters of water introduced with the sample of pulp, 100 cubic centimeters of fiftieth normal solution of ferrous sulphate and 40 to 42 cubic centimeters of wash water, making a total of 300 cubic centimeters.

One hundred cubic centimeters of the liquor are pipetted off and the pulp in the liquor is prevented from being sucked into the pipette by holding a Gooch crucible before the end of the pipette, and the solution is then back-titrated with fiftieth normal solution of potassium permanganate which determines the amount of ferrous sulphate that has not entered into the reaction. Inasmuch as it is not possible to prevent the small fibres from entering the pipette, the titration must be effected as rapidly as possible and must be stopped at the first appearance of a red coloration.

The calculation of the quantity of potassium permanganate which has been consumed by two grams of pulp within thirty seconds is effected in accordance with the following equation: Consumption = 150 — (100 — 3a). In this equation (a) is the cubic centimeters of potassium permanganate solution which were required to back-titrate the excess ferrous sulphate.

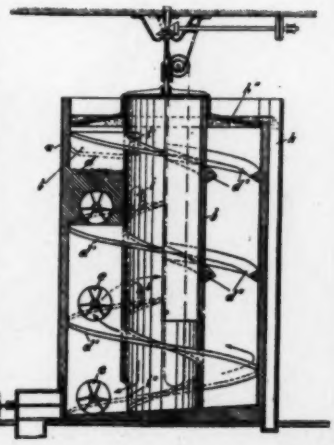
The results that have been obtained with this method compare very well with those that are secured by other methods in determining the degree of beating of pulp. This method possesses the advantage that only two to three minutes approximately are required for each determination, and furthermore in that it does not depend on the subjective color sense of the analyst. The dimensions of the apparatus are shown in the figure. Pappers-och Traevarutidskrift foer Finland, Jan. 31, 1927.

Mixing Tower Bleacher for Pulp

IN ORDER to obtain satisfactory circulation of the mass of fibres that are being bleached, a tube is arranged within the tower bleacher, which is used for bleaching wood pulp, and the fibres are introduced through this tube by means of a screw conveyor. The fibres then flow back on the outside of this tube, and in this way a circulation of the pulp is obtained and continued.

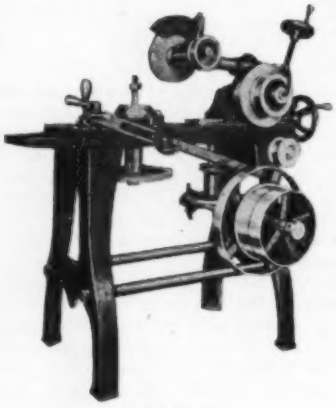
Such bleachers nevertheless possess the disadvantage in that the diameter of the bleaching tower cannot be made as large as one would desire. When the diameter of the bleaching tower is increased above a certain maximum, the pulp will remain stationary in a number of different places, and the result then is pulp which is unevenly bleached.

In order to get around the aforementioned difficulties, the pulp is given not only a motion in a vertical direction, but it is also agitated by baffles and propellors and the like in such a manner that it must travel over a longer path which is greater than double the height of the tower. This renders it impossible for the pulp to remain quiescent at different points instead of keeping in circulation, and the height of the tower can be chosen at will.



The accompanying illustration shows the bleaching tower (a) which is provided with a tube (b) and the agitating devices (c), which give the pulp a sort of helical motion, which takes place on the outside of the tube and from the bottom upwards. The result then is that the pulp which is introduced at the top of the bleaching tower and which is raised later to the top of the apparatus is again allowed to drop

Most Every Paper Mill Has Koegel Equipment



THE STANDARD
Capacity—8½-inch Diam. Slitters

Specifications: Floor space, 27"x 42"; speed of spindle, 55 revolutions; driving pulley, 9"x2½"—speed, 400 revolutions; emery wheel, 7"x½"—speed, 3,000 revolutions; weight, about 425 lbs.

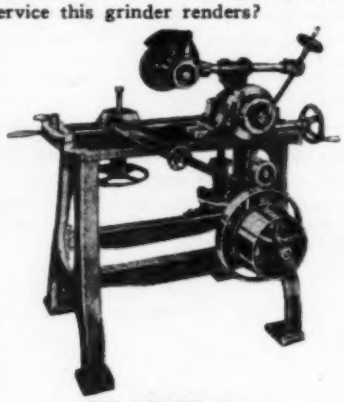
Over 800

Standard Koegel Patent Universal Slitter and Circular Knife Grinders are in the paper and pulp mills of the United States and Canada. What greater evidence could be offered for the universal service this grinder renders?

For Greater Capacity

The Koegel No. 4 Patent Universal Slitter and Circular Knife Grinder is built for Slitters up to 16" in diameter. In mills where larger diameter knives and slitters are used, 150 are in service.

Here are the specifications: Floor space, 32"x52"; speed of spindle, 55 revolutions; driving pulley, 10"x2½"—speed, 400 revolutions; emery wheel, 8"x½"—speed, 3,000 revolutions; weight, about 525 lbs.



THE KOEGEL No. 4
Capacity—16-inch Diam. Slitters

CHAS. KOEGEL'S SONS, Inc.

Slitters and Specialties

HOLYOKE MASSACHUSETTS

Established 1828

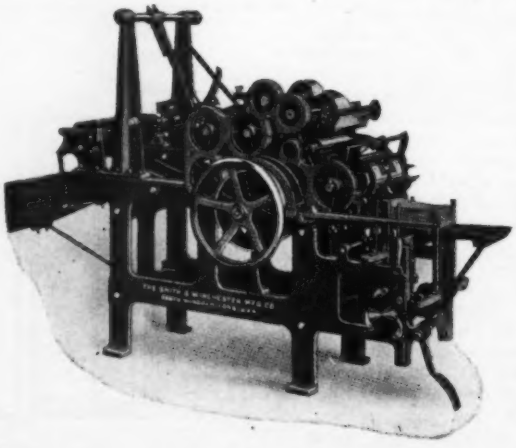
The

Smith & Winchester Mfg. Co.

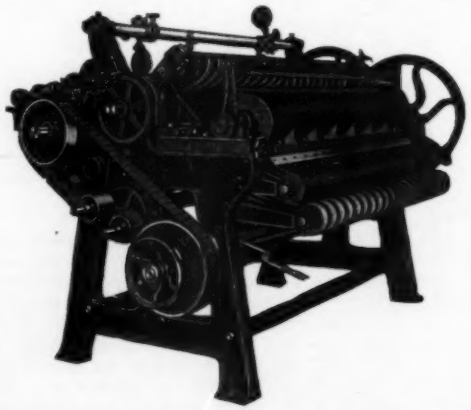
SOUTH WINDHAM, CONN.

Manufacturers of

Paper Making Machinery



Paper Bag Making Machinery



PAPER CUTTERS

Single—Duplex—Diagonal

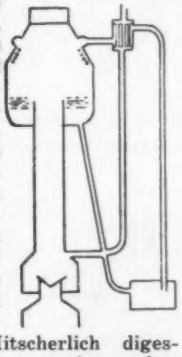
CUTTER KNIVES
PATENT TOP SLITTERS

HAMBLET MACHINE CO.
LAWRENCE, MASS.

through the tube to the lowest point in the tower. In order that the circulation of the pulp is maintained through the tower which may not be entirely filled with the mixture of pulp and bleach liquor, openings are provided at (i) at various heights in the tube (b). These openings can be closed at will. In order to force the pulp to travel in a helical direction around the outside of the central tube, helical shaped guide walls (d') or ribs (d") are provided. A washing arrangement is shown at (h"), which consists of a conical or horizontal circular screen through which the pulp is pressed. The wash water runs off through the passage (k), while the stock which is pressed out comes back through the tube (b), that is over the trough (1) and through the opening (i'). Then the bleached pulp passes through the opening (i") from the tube (b) into the helical tower bleaching space. German Patent No. 441,293.

Heat Economy and Sulphite Digestion

THE AMOUNT of heat required for the dissolving away of the incrustating materials on the wood is figured as 12,500 kilogram calories per hundred kilograms of pulp. This quantity of heat amounts to only six and one-half per cent of the total amount of heat added to the sulphite digester. Inasmuch as in sulphite digestion an aqueous solution acts on the wood at a temperature of over 100 degrees C, the process can be carried out only in a closed vessel which is resistant to internal pressure. The question arises as to whether a continuous digestion process is possible in such a vessel, for in such a process some of the waste heat could be utilized to good purpose in preheating the materials treated as well as the digestion liquor. The incrustating materials are dissolved away from the wood at a temperature of 105 to 108 degrees C. This corresponds to a pressure of 0.4 atmosphere, and such a pressure can be obtained with merely an open standpipe. The operating temperature is 125 degrees C in the Mitscherlich digester correspond to 1.5 atmospheres pressure and 145 degrees C in the Ritter-Kellner digester corresponding to 3.3 atmospheres pressure.



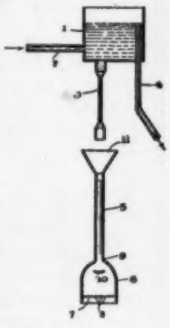
The reason why the digestion requires a comparatively long time is due to the irregular distribution of the temperature in the digester contents, and this distribution is the worse, the less liquor is brought into contact with the wood per unit mass of wood, in order to obtain a greater yield of pulp per unit cubical contents of the digester and to obtain a waste liquor which is not so dilute. In the Mitscherlich digestion process, the operation is allowed to continue after reaching a temperature of 112 degrees C, the steam valve being partially closed. The result is that layers of different temperatures are formed in the digester and these temperatures must be equalized. A better circulation is obtained when more liquor is present, but this necessitates the consumption of more heat and gives greater heat losses in the waste liquor.

If additional masses of wood are passed through the same quantity of liquor, and if the liquor is thereby maintained at the same temperature, then it is necessary to add merely the heat necessary to effect reaction and to cover the heat losses which are due to radiation, etc. In order to determine the speed of the passage of the wood through the apparatus, it is necessary to take into consideration the fact that too great a working speed must be avoided from technical reasons. The speed of passage of the wood through a digester of twelve meters in height and at a digestion time of 27 hours (without considering the time of emptying and filling the digester) is calculated to be 0.446 meter per hour, and the hourly output is 600 to 800 kilograms and is not particularly large.

It is seen that intermittent digestion is costly. The idea was considered of passing the wood through a certain height of heating column in which the liquor is at rest with the idea that after the wood has passed through this mass of liquor it will be in finished digested condition. Such an apparatus is shown in the accompanying sketch, and the wood chips are caused to fall in an uninterrupted stream through the digester filled with liquor, and the liquor constantly flows through a heating device into the digester. Hence the temperature of the liquor is constantly maintained at the proper point Zellstoff und Papier, 1927, page 14.

Freeness Tester for Pulp

UNITED STATES Patent No. 1,627,010 describes a freeness tester which is shown in the accompanying illustration. It is an apparatus for measuring the resistance offered to a flow of water through a porous mat of material. It comprises a graduated tube (5) which is closed at its lower end by means of the screen plate (7). This screen supports the material that is being tested. A device is provided for feeding water to the tube at a fixed rate. This device is composed of a tank (1) which is filled with water. A run-off pipe (4) and an inlet pipe (2) are connected with this tank. The outlet pipe maintains the water at a certain level, and this can be adjusted by allowing just enough water to flow into the tank so that the level remains at a certain definite point controlled by the overflow pipe.

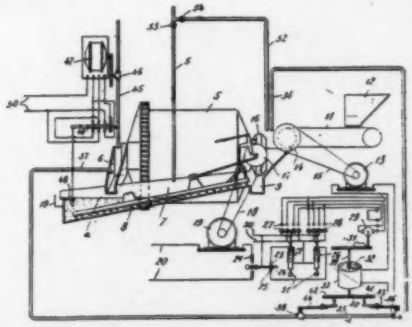


Ligno Tanning Material from Waste Sulphite Liquor

THE PROCESS of producing a tanning material, as described in United States Patent No. 1,629,448, consists in cooking waste sulphite liquor with lime at a temperature of about 130 degrees C until the ligno-sulphonic components of the sulphite liquor are partly desulphurized and the sugary components of the sulphite liquor are converted into organic acids, with the formation of a complex precipitate. Then carbon dioxide is percolated through the mass until it is neutralized which results in the precipitation of calcium carbonate and calcium sulphite and the various organic precipitated constituents are dissolved. The mass is then filtered in order to remove the precipitate, the filtrate is concentrated and treated with an amount of sulphuric acid which is equivalent to its calcium content, thereby precipitating calcium sulphate and forming a soluble tanning material comprising ligno-sulphonic acid in combination with organic acids.

Treating Pulp

HE illustration shows an improvement in an apparatus which is employed in the treatment of pulps and which is patented in United States Patent No. 1,619,807. This apparatus includes a classifier for effecting the separation of



solids of different character in the pulp by overflow and settling. The operating part of the apparatus comprises means for adding the liquid to the pulp which is being treated and means for producing an action representative of predetermined variations in the accumulation of settled solids in the classifier, as well as means for automatically controlling the liquid adding device in response to this action.

Preparation of Pulp

CELLULOSIC material in cake or block form suitable for use in paper manufacture is obtained from bamboo by finely disintegrating the bamboo, boiling the disintegrated material with quicklime until it can be worked up to a pulp, washing the pulp which is thus obtained, and submitting it

Announcement!

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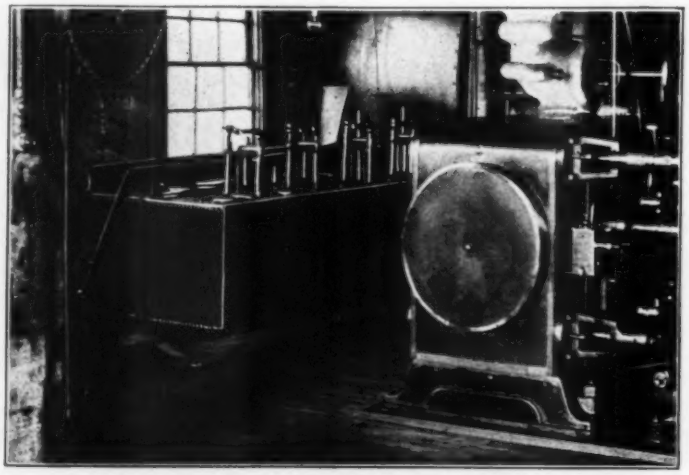

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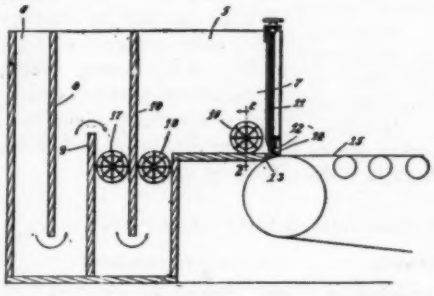
to pressure to produce coherence of the material. Preferably the pulp obtained after the boiling operation is ground before it is submitted to pressure. To refine it, the cake or block of material may be treated with a solution of sodium hydroxide and finally bleached by means of a liquor which contains chloride of lime. British Patent No. 265,697.

Mixer for Fourdrinier Flow Boxes

UNITED STATES Patent No. 1,629,088 is concerned with a pulp mixer for the flow box of a paper making machine. This comprises a series of perforated circumferentially spaced



and radially arranged mixer plates, shown at (18). Means are also provided for rotating the mixer.

Pulp Digestion and Resistance of Wood

THE cold climes of the Northern lands are favorable as far as the quality of the pulpwood is concerned, for the cold temperatures serve to increase the density of the woody cells. In Middle Europe wood of equal density is found only in very favorably located places. There are accordingly differences in the character of pulpwood according to the place where it is grown, and this refers also to the proportion of rosins in the wood which always increases the difficulty of its digestion. The character of the soil is also important in this connection. For certain soils will tend to the production of wood with a high amount of rosin. This is true of sandy and dry soils while wet and heavier soils do not give a wood with so high a rosin content.

According to the author all these phenomena are manifested in differences in the degree of resistance that the wood shows in the digestion process. This must be taken into consideration in purchasing the wood, for each kind of wood can be treated in a manner best suited to it or rather to the degree of resistance which is manifested by it. It is therefore recommended that the wood be segregated into groups according to the sections from which it comes, and in this way it will always be possible to process wood which is of uniform resistance to the action of the digestion liquor. The age of the wood must also be taken into consideration, and pulpwood of approximately the same age only should be used in the pulp making process. When such a method of working is adopted, a pulp of uniform quality is obtained.

The degree of resistance of the wood is determined by the pentosan content, the analysis being carried out under definite conditions. For according to Schwalbe the ingredients of the incrustating material on the wood go into solution in the following order: hexosans, lignin, pentosans, and with the dissolved quantity of pentosans at the same times affords a good measure of the degree of resistance possessed by the fibre against digestion. The use of magnesium salt containing digestion liquors is recommended as a means for accelerating the digestion of highly resistant woods.

In Finland the sulphate process is carried out only on waste wood, and the sorting of this wood according to the manner in which it is digested is a more difficult matter. Nevertheless, it is still possible to arrange the wood according to various degrees of digestibility, and this has an important effect in increasing the economy of the process. In order to accelerate the digestion process in this case it is necessary to adjust the ration of sodium hydroxide and sodium sulphide in suitable manner, and this has the effect of increasing the rapidity of the digestion process much more effectively than by raising the temperature and pressure, which always has the result of impairing the quality of the manufactured wood pulp.

Long contact with water makes the pulpwood more easily digestible, a condition which is induced by the dissolving out of the resinous and fatty substances. On the other hand such wood requires a greater concentration of digestion liquor, for the moisture in the wood will dilute the liquor to a considerable degree. Pappers—och Travearutidskrift foer Finland, 1927 number 2.

Digestion of Spruce Wood with Sodium Bisulphite

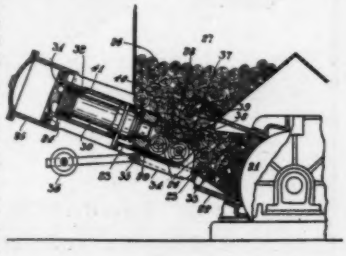
DIGESTION of spruce wood with the aid of sodium bisulphite liquors takes place with somewhat more difficulty than with the calcium liquor. A twelve per cent solution of sodium bisulphite at a temperature of 130 degrees C or at 140 degrees C gives practical products. There is exceptional liability to "black cooks" with concentrated liquors, for example with eighteen per cent solution of sodium bisulphite at a temperature of 140 degrees C. This tendency is attributed to the low hydrogen-ion concentration of the sodium bisulphite liquor, since high initial hydrogen-ion concentration protects against this decomposition. On the other hand, the yield of cellulose is extremely high.

The first stage of the process consisting in the combination of the bisulphite with the lignin-carbohydrate constituent takes place very rapidly at a low temperature. The second stage, during which this solid ligno-sulphonic acid is hydrolyzed, proceeds slowly under normal conditions, so long as decomposition of the bisulphite liquor and formation of sulphuric acid are negligible. At this stage the ratio of carbohydrates to lignin in the liquor remains normal and constant.

In cooks carried out without blackening, the cellulose is characterized by a high content of insoluble lignosulphonic acid, equivalent to 3.5 to 7.0 per cent of lignin, or 13 to 25 per cent of the original lignin in the wood. The ratio of reducing sugars after inversion, to direct reducing sugars in the liquor, remains at about 4.0. Notable destruction of pentosans occurs even in the early stages of digestion, but the lignin of wood contains 1.24 per cent of substance yielding furfuraldehyde expressed as pentosan which is not a pentosan. The pulps from the sodium bisulphite digestion are easily resolved into fibres, but on account of their high content of insoluble lignosulphonic acid, they belong rather to the class of "half-celluloses" and yield papers of very high strength and folding qualities. Der Papierfabrikant, volume 24, pages 775-80.

Pulp Grinder

THE illustration shows a pulp grinder patented in United States Patent No. 1,692,015. This grinder consists of the combination of a frame, a grinding stone, which is shown at (21), the latter being rotatable in the frame. The wood magazine is shown at (27), and means are provided in this magazine for feeding the wood through the same towards the stone. The means for actuating this magazine in a direction towards the stone for feeding wood to the latter, during the interruption of the feeding means, are also shown in the figure.



Testing Sulphite Liquor

THE course of the reaction in the potassium iodate titration of sulphite liquor is as follows—sulphurous acid is oxidized to sulphuric acid by the iodine, while the latter is correspondingly reduced to hydriodic acid. The equation of reaction is, (a). $H_2SO_3 + I_2 + H_2O = H_2SO_4 + 2HI$.

If potassium iodate is added in excess to the above solution, then it will have an oxidizing action on the hydriodic acid and on the potassium iodide which is in the iodine solution added. For iodine will be set free, and this can be titrated with the aid of a standard solution of tenth normal thiosulphate. The amount of iodine thus separated is ex-

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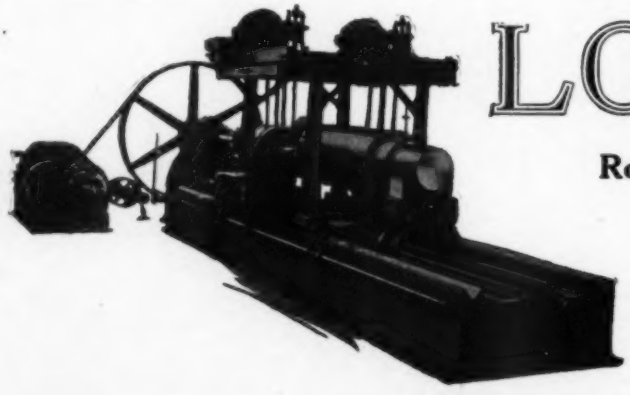

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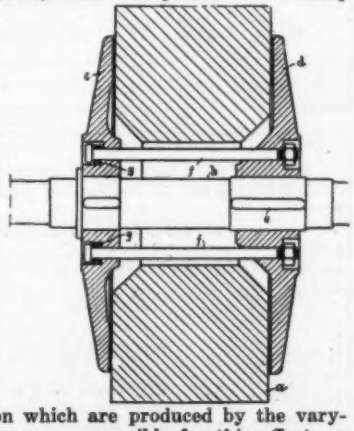
actly equivalent to the acid present. (b). $3H_2SO_4 + 6HI + 2KIO_3 = 3K_2SO_4 + 6I_2 + 6H_2O$. There are twelve ions of hydrogen on the left side of the equation and the same number of iodine atoms on the right side.

The iodate method is practically just as sensitive towards weak acids as the sodium hydroxide titration in the presence of phenolphthalein. A simple test proves this and it is therefore concluded that it is impossible to obtain any greater accuracy in using the iodate method for analyzing digestion liquors that contain the organic acids than in the case of the Hoehn method. In both cases the acidity determination gives not only the "fress sulphurous acid" which is sought but also the sum of all the acids, including the weak inorganic acid as well as the organic acids.

The errors that are introduced into the iodate method due to the presence of carbon dioxide are quantitatively shown by the following experiment. A tenth normal solution of sodium hydroxide is accurately neutralized with a tenth normal solution of hydrochloric acid using methyl orange as the indicator. Twenty cubic centimeters of the tenth normal sodium hydroxide are equal to the same volume of the tenth normal hydrochloric acid solution. Twenty cubic centimeters of the tenth normal hydrochloric acid solution were added to ten cubic centimeters of sodium hydroxide, so that there is an excess of ten cubic centimeters of hydrochloric acid, and then a solution of potassium iodide and potassium iodate is added. A precipitation of iodine took place which corresponded to 10.13 cubic centimeters of tenth normal solution of thiosulphate. In other words the solution reacts about 0.13 cubic centimeters more acid due to the carbon dioxide developed from the soda content of the tenth normal soda solution, than what corresponds to the hydrochloric acid added. On the other hand, if the solution, consisting of ten cubic centimeters of sodium hydroxide and twenty cubic centimeters of hydrochloric acid is boiled for a short time and cooled and then mixed with the iodide-iodate mixture, then a proportion of iodine is evolved which corresponds exactly to ten cubic centimeters of tenth normal thiosulphate. In order to compare the carbon dioxide errors observed here with that incurred in the titration with sodium hydroxide in the presence of phenolphthalein, ten cubic centimeters of tenth normal sodium hydroxide solution were likewise mixed with twenty cubic centimeters of tenth normal hydrochloric acid solution and the excess acid was titrated with the aid of sodium hydroxide in the presence of phenolphthalein. On the other hand if the sodium hydroxide is added on repeated boiling, then only ten cubic centimeters of tenth normal sodium hydroxide solution are used. Zellstoff und Papier 1927, pages 56-7.

Fastening Stone on Its Shaft

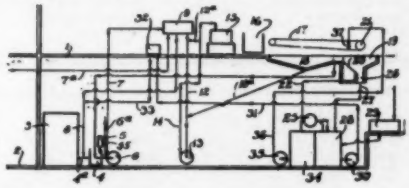
THE usual method of fastening the grindstone on its shaft in grinders for the production of mechanical wood pulp, whereby the stone is held by means of plates which clamp the stone, which plates are held by means of threaded bolts on the shaft itself, possesses the difficulty that due to the different temperatures that prevail in the stone and the shaft, and the variations that take place therein due to the irregular operation of the grinder, stresses of considerable magnitude are induced in the stone which are often strong enough to break the fasteners that hold the latter to the shaft. The expansion and contraction which are produced by the varying temperature conditions are responsible for this effect.



The new method of fastening the stone to the shaft avoids this difficulty. (A) may be seen from the figure, which shows the arrangement which has been patented in German Patent No. 441,079, the stone is indicated at (a) and the side walls or plates that hold are shown at (c) and (d). One of these side walls (c) is firmly fixed to the shaft (b) while the other (d) is arranged so that it can be moved on the shaft but not rotated. Both the plates which hold stone in place are held together by means of threaded bolts (f), which are made to pass through the plates. A strong spring (g) is placed under the head of the threaded bolt and the dimensions of the spring are chosen in such a fashion that its action on compression and the reaction on release of the pressure lie within the allowable limits.

Making Paper

THE process which is patented in United States Patent No. 1,620,860 and which is concerned with the manufacture of paper consists in automatically effecting and maintaining the consistency of certain stock ingredients, as the ground wood pulp, nears its source of supply. The stock is then continuously delivered and this delivery is regulated to a common stream for mixing stock ingredients and a continuous flow of the mixed stock is maintained directly to the paper making machine.



Fluorescence of Wood Cellulose and Vegetable Tanning Extracts

THE admixture of synthetic tanning agents or substitutes which are derived from sulphite liquor with natural tanning extracts can be detected by examining the color and intensity of the fluorescence of the diluted extract in ultra-violet light. Most of the synthetic products exhibit a characteristic violet fluorescence which, in the case of extracts derived from sulphite liquor, changes to green on making the solution alkaline. Cellulose fibres when dipped in tanning solutions irreversibly absorb some of the flourescent substance. Thus cotton, wool, viscose, hydrocellulose, and starch after immersion in quebracho or tizerah extracts, appear yellow, while pine or larch bark extracts cause them to exhibit a violet fluorescence.

Nitrocellulose does not absorb the violet substance and the amount of the yellow substance absorbed depends on the extent to which the cellulose is nitrated. A nitrocellulose containing eleven per cent of nitrogen exhibits a strong yellow fluorescence after immersion in quebracho extract, but a guncotton of 13.2 per cent nitrogen has very little absorptive action. Sucrose, lactose, dextrose, cystine, tyrosine and glycine anhydride exhibit no fluorescence with either solution. The violet fluorescence observed in sulphite liquor, when exposed to ultra-violet light, is also shown by unbleached sulphite cellulose.

Lignin on treatment with calcium bisulphite solution, also yields a solution having a violet fluorescence, but cotton wool, dipped in this solution, remains practically colorless. Solution-flourescence and fibre-flourescence are therefore due to the presence of different substances. Wood chips when heated with water at a temperature of 115 degrees C give a liquor which causes fibre-flourescence. It is, therefore, unlikely that this property is due to the presence of lignosulphonic acid, but to that of some substance already in the wood which has similar properties to, and may be identical with, the flourescent principle of pine bark extract. It is sensitive to alkalies and bleaching agents, hence bleached and soda cellulose do not exhibit fluorescence. Der Papierfabrikant, 1927, volume 25, pages 49-52.

The 40,000 volt transformer of the Champion Paper Co. was struck by lightning on the morning of May 31, and completely destroyed. Lightning arresters prevented the damage from spreading to the mill. It was necessary, however, to shut down the ground wood plant for several days.

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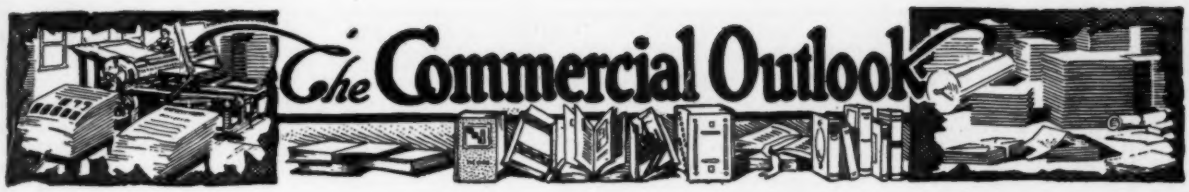

New York, June 1, 1927.

REPORTS concerning the paper market are somewhat mixed. In some quarters business is reported quite satisfactory; in others it is asserted there has been a slowing down process observed in the demand for many classes of paper recently, and it might be said to be a difficult matter to reconcile the two kinds of reports. Evidently it depends in considerable measure on the section of the country from which the reports emanate, and also on the class of paper involved. Generally, it would appear that there is a consistently good movement of supplies from mills into consuming and distributing channels, and of fairly large volume. The old bug-a-boo of small-lot buying is still talked of in numerous corners of the trade and no doubt this policy on the part of a great number of buyers is creative of a comparatively quiet market condition in some directions, yet such statistics as are available would show that paper production is on a fair scale and that the market is exhibiting at least normal activity.

There seems no denying that general business is rather dull. One would not derive this impression by reading the financial reports in the daily press which indicate that the big industrial organizations of the country are fully engaged and piling up profits at a rate where it is necessary for them to declare extra dividends, but the "little fellow," or the individual in business, is complaining very strenuously. His profits are narrow, to say the least, because competition forces him to conduct business on a very small margin of gain, and after all it is the innumerable small concerns which really form the backbone of the commercial structure and make business what it is or isn't. And it is these smaller organizations which are experiencing unsatisfactory conditions and realizing scant profits, so that business cannot be described as good. All of which reflects on the paper market and is creative of a situation not by any means favorable to the marketing of paper in a manner and volume pleasing to the hearts and pocketbooks of paper manufacturers and merchants.

Certain classes of paper stand out as enjoying a moderately wide market outlet, whereas other classes are moving in relatively smaller tonnage. It is apparent on all sides that consumers, and jobbers too, are buying only to satisfy direct requirements. The hand-to-mouth scheme of purchasing is being worked to a fare-thee-well, and this procedure in acquiring supplies does not make for any unusual scope of demand. On the other hand, it must be said that demand is steady; this necessarily is so when buyers are covering immediate needs chiefly, because they are kept operating in the market more or less all of the time. Prices of paper with few exceptions are well maintained. This is nothing of a surprise because market levels have been reduced to where there is little or no room for further recession, if producers of paper are to eke out a profit in their operations. In some instances a rising tendency is noted but as a general thing prices simply are holding their own while recording virtually no change.

Production of paper in the United States showed a considerable increase in March as compared with the preceding month, amounting to a total of 596,448 net tons, against 525,896 tons in February, a gain of 13 per cent for identical mills, according to the monthly statistical summary of the industry issued by the American Paper and Pulp Association and affiliated organizations. Mill stocks increased to some extent during March, totaling 246,783 tons of all grades of paper and board at the end of that month, contrasted with 238,380 tons at the end of February. Shipments from mills in March aggregated 587,096 tons, against 526,318 tons in the preceding month.

Newsprint production continues on a heavy scale although the output in April recorded a slight decline from the March total. During April production of newsprint in Canada amounted to 166,460 tons, and shipments from mills to 168,511 tons, according to the News Print Service Bureau, while production in the United States was 130,236 tons and shipments 129,010 tons, making a total U. S. and Canada output of 296,696 tons and shipments of 297,521 tons, contrasted with 307,825 tons produced and 298,512 tons shipped in March. During April, 15,178 tons of newsprint were made in Newfoundland and 1,247 tons in Mexico, so that the total North American production for that month was 313,122 tons.

The Canadian mills produced 73,081 tons more of newsprint in the first four months of this year than in the same time last year, which was an increase of 13 per cent. The United States output was 39,948 tons or 7 per cent less than in the first four months of 1926, that in Newfoundland 10,985 tons or 20 per cent more, and in Mexico 663 tons or 16 per cent more, making a total North American increase of 44,781 tons or 4 per cent. Production for North America in the first four months of 1927 totaled 1,246,124 tons, against 1,201,343 tons in the same period last year, and 1,022,697 tons in the first four months of 1925. During April the Canadian newsprint mills operated at 85.4 per cent of their rated capacity and the U. S. mills at 87.2 per cent. Stocks of newsprint paper at Canadian mills totaled 26,389 tons at the end of April, and at U. S. mills 24,105 tons, making a combined total of 50,494 tons, which was equivalent to 3.8 days' average production.

Boxboard production was a bit lower in April than in March, according to the monthly statistical report compiled and issued by the U. S. Department of Commerce. Mills of the country made a total of 204,396 net tons of board of all grades in April, against 219,682 tons in March, the production for the first four months of this year amounting to 786,980 tons, contrasted with 827,778 tons in the corresponding time a year ago. Board mills produced at 80.4 per cent of their rated capacity in April, against 83.3 per cent in the preceding month. During April they received new orders calling for 196,528 tons of board, against 229,376 tons in March, and had unfilled orders for 101,361 tons at the end of April, compared with 113,583 tons a month previous. Shipments of board from mills aggregated 208,750 tons in April, against 217,973 tons in March, and stocks at mills totaled 49,973 tons at the end of April, contrasted with 54,327 tons at the end of March. Board mills consumed a total of 188,829 tons of waste paper during April, as compared with 209,388 tons in the preceding month.

The March index number for paper production was 117, compared with 106 for February and 127 for March of last year, taking 1919 as 100 per cent, according to the U. S. Department of Commerce.

Newsprint is moving into consuming channels in a steady manner and in large tonnage. A glance at the size of any of the city daily newspapers tells the story of the present big consumption of print paper, which it is understood is running close to a record. Book paper demand is fairly active and of moderately large volume, while quotations are maintained. Fine paper demand is developing consistently enough though it is of comparatively limited volume. Manufacturers are holding to previous prices. Kraft wrapping is firm quotably and in steady demand. Tissue is enjoying fair market activity and prices exhibit a stiffening tendency. Box-boards are moving freely against direct requirements but consumers are buying carefully and almost solely to satisfy immediate wants. Quotations show no change. Building papers are in more demand, the market for roofing and sheathing paper having improved substantially in recent weeks. Wall board is in good demand and firm in price.

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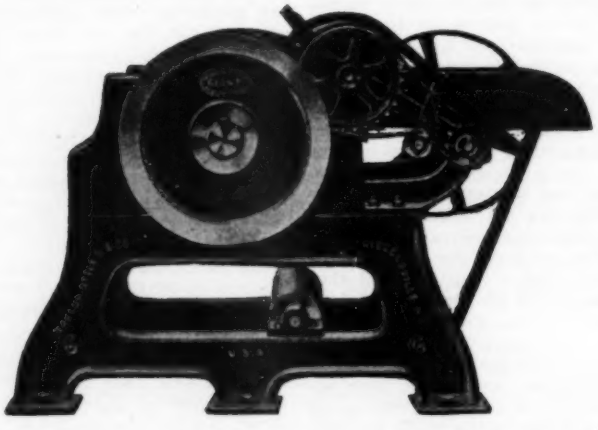

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Papermaking Rags

There seems little question but that the undertone in the market for papermaking rags is growing firmer. Following a rather long-drawn-out period of comparative dullness and price easiness, the situation is developing more activity and values appear to be looking up. Indications are that the firmer tendency in prices is due more to conditions on the supply end of the market than to any broad expansion of demand from consuming quarters, but the fact remains that values are inclining to stiffen, particularly as concerns a few certain classes of rags.

The situation abroad in rags is having pronounced influence on the market here. Importers report that it is becoming increasingly difficult to buy in various European countries at prices in keeping with market levels prevailing in the United States; in other words, prices in Europe are in many cases well above a parity with those here, and, under the circumstances, shippers on the other side of the Atlantic are less concerned about exporting supplies to America because they are enabled to secure more attractive prices in sales to domestic consumers. It is a fact, according to numerous authentic reports, that the paper manufacturing industry in Europe—and more especially in Germany and France—is experiencing vastly improved conditions and is much livelier than it has been in a long time; therefore paper mills are in need of larger quantities of rags and are granting higher prices. As regards some grades suitable for papermaking, it is declared that importers cannot begin to cover such commitments as paper manufacturers in the U. S. are willing to make and realize a profit because consumers in this country offer prices substantially under a parity with the market levels ruling abroad.

The result of this situation is that paper mills are directing more attention to domestic rags, and demand for such stock has increased quite a good deal, thus causing at least a slight improvement in prices. Moreover, it is reported the floods in the South have led to a marked expansion of demand for roofing felt and building papers—not for immediate consumption, but for accumulation of stocks at vantage points in the flood area to be in readiness for the reconstruction work after the rivers have subsided—and mills making such papers have speeded up production and have increased their buying of rags. The domestic supply of roofing rags seems fairly well sold up at present, and it is the contention of dealers that manufacturers shortly will find it necessary to purchase foreign rags in addition, in which event it is felt they will have to pay higher prices in order to get the required supplies from European sources.

Summing the situation up, it might be said that, from all appearances, prices of rags have touched bottom for awhile, and that some paper mills have permitted their stocks to dwindle to a level where they have been obliged to engage in a bit more buying, thus creating a firmer tendency in values. There is little doubt prices of rags were allowed to sink too low—so low, in fact, scant profit has been afforded collectors and dealers, with the obvious consequence that collections have been curtailed materially, and now that consumers are more interested in buying there is not the customary supply coming into the market.

Roofing stock has firmed in price to where New York dealers quote 1.75 cents or higher per pound f.o.b. that city for No. 1 packing of cloth strippings, and 1.45 cents for No. 2 stock, and above these prices frequently is asked. Foreign dark colored cottons are quoted for forward shipment from abroad at 1.65 cents or more ex dock New York, and foreign linsey garments at 1.80 cents. Old white cottons rule steady in price at around 6.25 cents per pound at shipping points for the usual run of No. 1 repacked, with substantially higher quoted for choice packing for particular paper mills, while repacked thirds and blues are quoted at around 2.25 cents f.o.b. dealers' points and rough blues at 1.75 cents. Prices of imported old cottons and linens are tending upward, and it is noticed that importers are firmer in their demands regarding the rates asked.

New cuttings are moving in a fairly consistent manner, especially some grades, and quotations generally are well maintained. A few descriptions are in relatively small supply, and these are quoted firmly. Dealers ask 12 to 12.25 cents per pound at shipping points for No. 1 white shirt cuttings, and 6.50 cents for fancy shirt cuttings. Blue overall cuttings are quoted at 7.50 cents, light silesias at 7.75 cents, No. 1 washables at 5 cents, black silesias at 5.75 cents, and O. D. khaki cuttings at 6 cents.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	12.00-12.25
White shirt cuttings, No. 2	8.00- 8.50
Fancy shirt cuttings	6.25- 6.50
Washables, No. 1	4.75- 5.00
Unbleached muslines	10.00-10.25
White lawns	9.25- 9.50
Overall cuttings, blue	7.25- 7.50
Black silesias	5.50- 5.75
Light flannelettes	8.50- 8.75
Canton flannels, bleached	9.50- 9.75
Canton flannels, unbleached	8.25- 8.50
Shoe cuttings, bleached	9.25- 9.50
Shoe cuttings, unbleached	8.25- 8.50
Light silesias	7.50- 7.75
O. D. khaki cuttings	5.75- 6.00
Mixed khaki cuttings	5.00- 5.25
Corduroy cuttings	3.50- 3.75
Cottonade cuttings	4.00- 4.25
Linens, No. 1 white, foreign	13.00-13.50
Light prints, foreign	3.00- 3.25
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	3.00- 3.50
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.65- 1.85
Thirds and blues, repacked	2.00- 2.30
Black stockings	3.75- 4.00
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	2.50- 2.75
Roofing, No. 1 (cloth strippings)	1.75- 1.85
Roofing No. 2	1.45- 1.50
Linsey, garments, foreign	1.80- 1.90
Dark colored cottons, foreign	1.65- 1.70
Blue linens, foreign	4.00- 4.25
Gray linens, foreign	4.25- 4.50
White linens, foreign	8.00- 8.50
Light prints, extra, foreign	1.75- 2.00

Rope and Bagging

Old rope has eased off in price, due to a narrower demand from paper mills. It is reported that most manufacturers making rope papers have experienced a falling away of business in their product, and consequently have let down in their purchases of raw material; it is stated also that substitute materials are being consumed in quite a few cases for old rope, thus further reducing the demand for this article. Leading consuming mills announced a cut in prices of old rope during May amounting to about $5 per ton, and market levels now are around 4.25 cents or slightly higher per pound f.o.b. shipping points for No. 1 domestic manila

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Over 75 stock distributing points assure prompt shipment with minimum transportation charges.

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GOOD RAGS FOR PAPER MILLS NEW CUTTINGS

The Leshner Paper Stock Co.

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Branch—Cleveland, Ohio

THE MICHIGAN PIPE COMPANY

Manufacturers of

COMBINATION STEEL AND WOOD PIPE

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Special Flange for Paper Mills.

ADVANTAGES:
Saves Power
No Discoloration
Lasting Qualities
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PRODUCTS:

Pipe for conveying—Pure Water, Acid Water, White Water, Sulphite Waste Water, Paper Stock, Ground Wood Pulp, Gases

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Michigan Pipe for Paper Mills
Liquid Conveyed Touches No Metal

Showing the Special Flange Joint, Light in Weight, Specially Desired for Inside Installations. Easy to Take Apart

SERVICE:
We maintain experts who will take entire charge of pipe installations if desired.

rope, and 3.50 cents ex dock New York for foreign No. 1 rope. Old strings are in routine demand only and prices show little or no change, purchases being effected at a cent per pound at dealers' points and probably at a little less.

Bagging is in about average demand from paper mills. There is a good call for roofing mill quality but the better grades are moving rather slowly. Dealers quote No. 1 scrap bagging around 1.75 cents a pound f.o.b. shipping points, and roofing bagging at 1.35 cents, while gunny bagging has moved off slightly in price to a level of about 2 cents a pound for No. 1 domestic gunny at shipping points.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.90-2.10
Gunny, No. 1 foreign	1.80-2.00
Scrap bagging, No. 1	1.60-1.80
Roofing bagging	1.30-1.35
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila rope, No. 1 foreign	3.50-3.75
Manila rope, No. 1 domestic	4.25-4.50
Sisal strings	1.75-2.00
Mixed strings	1.00-1.25

Old Paper

Generally in most parts of the country it is reported a fair demand exists for old paper. In New York City, however, the market seems in a condition bordering onto demoralization, and the situation in that important center where prices are on an unusually low level has influence to some degree on the market lesewhere. Dealers say the condition of the market at best is far from satisfying. It is necessary for them to handle stock on a very close margin of profit, and the spotty manner in which board manufacturers and other consumers are buying makes for considerable difficulty and has the effect of narrowing down profits.

Quoted prices of the low qualities continue on a broad range. In the East folded news is reported at as low as 45 cents per hundred pounds f. o. b. New York, and No. 1 mixed paper at 35 cents, whereas in the Middle West these grades are bringing 65 and 70 cents for the former and 60 cents for the latter. Books and magazines are quite steady in price at 1.25 cents per pound at shipping points for No. 1 heavy book stock, and old kraft is selling freely at 2 cents at dealers' points for No. 1 packing. Shavings are quoted 2.90 to 3.15 cents a pound f. o. b. shipping points for No. 1 hard white, and 2.65 to 2.90 cents for soft white shavings.

The following are quotations named by dealers f. o. b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.90-3.15
Hard white shavings, No. 2	2.65-2.85
Soft white shavings	2.65-2.90
Colored shavings	1.00-1.25
Heavy book, No. 1	1.20-1.30
Crumpled book, No. 1	.85- .95
Ledger stock	1.40-1.65
Kraft, No. 1	1.90-2.10
Manilas, No. 1	.65- .80
White blank news	1.40-1.50
Overissue news, No. 1	.55- .75
Folded news	.45- .65
Sulphite mill wrappings	.65- .75
Mixed paper, No. 1	.35- .60
Common paper	.25- .40

Pulpwood

The market for pulp timber is fairly active, according to reports. Consumers are absorbing supplies freely despite the quite market situation in ground wood, the explanation apparently being that most grinders are in need of sizable supplies of wood from which to make pulp for their own use. Prices are well maintained though they exhibit no definite trend. The Canadian Pulpwood Association reports that ruling prices in New Brunswick range from $10 to $11 per cord f. o. b. cars in central and southern New Brunswick for spruce and $7 to $7.50 a cord for poplar.

GDC

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the
Manufacture of

New Paper Specialties

or if you are confronted with color problems of any kind, such as fastness to light, fastness to alkali, two sidedness, please consult our newly equipped laboratories and our experienced staff.

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Paper Stock Corporation
Formerly with the Gatti-McQuade Co.

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COTTON AND WOOLEN WASTE

All Grades of
RAGS AND PAPER STOCK, NEW WRAPPING PAPER
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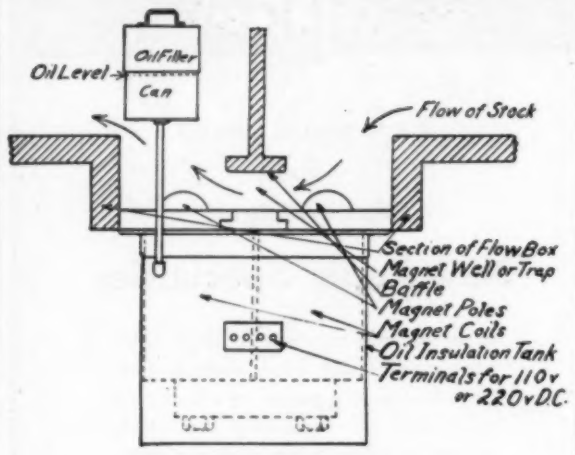

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are giving excellent service in many Paper Mills. Positively removes all Iron Particles and many other foreign substances from paper stock.

Write for Bulletin and prices of latest improved type

Coward & Coward
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A FIRST REQUISITE
IN
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Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

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Pickles' Patent Automatic Steam Regulator FOR Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

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MANUFACTURERS OF
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ANIMAL SIZING GLUE STOCK
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Hand Brush-Outs in the Coating Mill
Semi-Chemical Pulping
Thermodynamic Comparison of Paper Drying Methods
Significance of the Alpha Cellulose Test
Vacuum Drum Washers
Code Comparison of Grinders
Lime Sludge Analysis
Wagner Stationary Recovery Furnace
Strength Tests for Sulphite Pulp
Identification of Piping Systems
Analysis of Water
Glue-Bound Coated Paper
Constitution of Spruce Wood Lignin
Chemistry of the Sulphite Process
Methods of Testing Chemical Lime
Hardinge System of White Water Treatment
Chemistry of Wood Cellulose
Study of the Eastman Colorimeter
Hydrogen Ion Control
Proceedings of the Annual Meeting

Write to THE PAPER INDUSTRY 356 Monadnock Building, Chicago, Illinois

Mechanical Pulp

The most important development in ground wood that has occurred in a long while was the announcement made in the early part of May that an agreement had been reached by representatives of the Swedish and Norwegian wood pulp industries to curtail their production of mechanical pulp by 200,000 long tons, or more than one-third, this year, the reduction being ordered on account of the unsatisfactory condition of the market. The output in Sweden is estimated at 253,000 tons annually, and in Norway 316,000 tons, a total for the two countries of 569,000 tons.

This is expected to lead to a much firmer ground wood market eventually, but it will require time for this drastic curtailment of output to have effect, particularly with the market shouldering as large a surplus of pulp as is now is. The probability is that with the Scandinavian countries producing less supply, British consumers will look to Canada to secure a good portion of their requirements, which in turn should relieve grinders in the Dominion of an appreciable part of their output and thus make for a stronger statistical market position in the U. S. and Canada as well as in Europe. Production for some time has far exceeded the needs of consumers, and gradually there has been piling up a surplus which has had a bad effect on the market, forcing prices down to where they now rest on levels which show little or no profit to manufacturers.

Canadian grinders are reported offering prime spruce ground wood at around $26 a ton f. o. b. pulp mills, and it is said most sales are at a bit below this price level or at not more than $25. Foreign ground wood of Scandinavin origin is quoted around $34 a ton ex dock New York or other American Atlantic ports for dry pulp. Domestic ground wood in the U. S. is rather nominal in price at approximately $30 a ton at grinding plants.

U. S. mills produced 108,692 tons of ground wood in March, compared with 82,409 tons in February, according to the American paper and Pulp Association. Stocks at producing mills at the end of March aggregated 128,920 tons, against 117,065 tons a month earlier.

Chemical Pulp

Moderate activity is reported in the chemical wood pulp market but it is stated most of the present movement of supplies is against contracts or old orders. Consumers are buying in a cautious manner, generally limiting purchases to bare requirements, and evidently proceeding on the theory that if they find they need larger supplies later on they will experience no difficulty getting all the pulp wanted. The price tone is none too steady; in fact, there has been a downward revision of quotations in many quarters in keeping with the lower prices named on foreign pulps.

Leading domestic producers of bleached sulphite continue to quote 4 cents upward per pound f. o. b. pulp mills for prime sulphite, some qualities ranging as high as 4.75 cents. Unbleached sulphite of No. 1 or news grade is quoted at about 2.75 cents a pound at producing plants, and of No. 1 book grade at 3 cents. Bleached soda pulp is 3.75 cents at pulp mills, and No. 1 kraft at 2.75 to 3 cents, depending on quality.

Production of chemical wood pulp in the United States during March last showed an increase over the preceeding month, totaling 119,849 tons of all grades, compared with 106,476 tons in February, according to the monthly report of the American Paper and Pulp Association. Mill stocks of chemical pulp at the end of March amounted to 21,517 tons, against 20,131 tons at the end of February.

Quotations f. o. b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	3.10-3.30
Unbleached sulphite, No. 1 strong (news grade)	2.65-2.90
Unbleached sulphite, No. 1 book	2.85-3.15
Soda pulp, bleached	3.75-4.00
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

John L. Golden, for many years salesman of the Continental Bag Co., died at his home in Syracuse recently. His death was due to injuries sustained in an automobile accident over a year ago.

"Distinguished for its high test and uniform quality."

Soda Ash

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Bicarbonate of Soda

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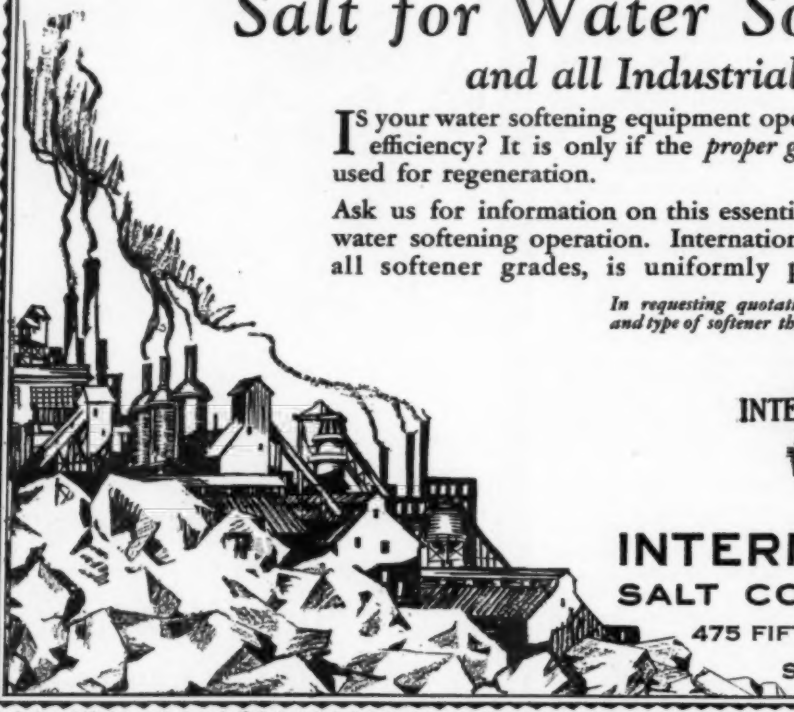
IS your water softening equipment operating at its highest efficiency? It is only if the *proper grade* of salt is being used for regeneration.

Ask us for information on this essential factor in Zeolite water softening operation. International Salt, supplied in all softener grades, is uniformly pure and reliable.

In requesting quotation please mention the size and type of softener that your plant is now using.



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SALT COMPANY, INC.
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"There never was anything made but someone could make it worse and sell it for less."

Consumer KVP Satisfaction

KALAMAZOO VEGETABLE PARCHMENT CO. KALAMAZOO, MICH.

New Papers

Writing—	
White rag	15-40
White sulphite	9-30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.50- 8.00
Machine finished	6.25- 8.00
English finished	6.25- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.50-15.00
Newsprint—	
Rolls, contract	3.25-.....
Rolls, transient	3.50-.....
Sheets	3.65- 3.80
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.25- 5.50
Southern kraft	4.75- 5.00
Boards—	New York and Chicago
Solid news	47.50-50.00
Straw	52.50-57.50
Plain chip	42.50-45.00
White coated chip	55.00-60.00
Manila coated chip	50.00-55.00
Binder's board	70.00-75.00

Chemicals

(*Continued from page 537*)

Demand for papermaking chemical is steady and there is a fairly good movement of supplies into consuming channels against contracts as well as current commitments. In general, prices display steadiness. Paper manufacturers are purchasing casein chiefly to cover direct needs, and prices rule firm at around 18.50 cents per pound, duty paid on the imported article. Caustic soda is quoted at 3 to 3.10 cents a pound, in large drums, f. o. b. works, and soda ash continues to sell at 1.32½ cents per pound at works for the product packed in bags. Bleaching powder quotation range from 2 to 2.40 cents a pound f. o. b. works.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	4.00 - 4.25
Bleaching powder	2.00 - 2.40
Brimstone (long ton, at mine)	18.00 -19.00
Casein (duty paid)	18.00 -19.00
Caustic soda, spot delivery	3.00 - 3.10
China clay, domestic washed	8.00 -10.00
China clay, foreign	14.00 -20.00
Rosin, grade E	10.00 -.....
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½-.....
Starch, papermakers', in bags	3.07 -.....
Talc (ton)	16.00 -18.00

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 25270—Paper mill machinery, modern. Soa Paulo, Brazil. Purchase desired.

No. 25325—Kraft paper for bags, 12 tons annually. Manaos, Brazil. Purchase desired.

No. 25309—Newspapers, overissued. Tientsin, China. Purchase desired.

No.25327—Paper, newsprint, art, and fancy. London, England. Agency desired.

No. 25328—Printing paper, and bank and bond paper. Johannesburg, South Africa. Agency desired.

No. 25438—Newspapers, white overissued. Delhi, India. Purchased desired.

No. 25436—Paper, crepe, tissue paper goods, tags, and paper towels and napkins. Valparaiso, Chile. Agency desired.

No. 25395—Paper, especially newsprint. Shanghai, China. Purchase and agency desired.

No. 25439—Printing papers. Prague, Czechoslovakia. Purchase and agency desired.

No. 25469—Papermaking chemicals. Hamburg, Germany. Purchase desired.

No. 25586—Pulp and paper mill machinery. Copenhagen, Denmark. Purchase desired.

No. 25588—Binding paper and buckram. Madrid, Spain. Agency desired.

No. 25587—Bond paper (cheap), blotting paper, carbon paper and manila folders. Cairo, Egypt. Agency desired.

No. 25586—Cardboard and manila paper. Copenhagen, Denmark. Purchase desired.

No. 25542—Newsprint paper. Guatemala City, Guatemala. Agency desired.

No. 25547—Toilet paper. Rio de Janeiro, Brazil. Agency desired,

No. 25596—Wrapping paper and other papers. Vienna, Austria. Agency desired.

No. 25588—Paper, newsprint, blotting, glazed, and stationery. Madrid, Spain. Agency desired.

Changes at West Jersey

Mr. Edw. Shelmerdine purchased all the interests in the West Jersey Paper Mfg. Co., Camden, N. J., the first of the year, and an improvement program started in April has recently been completed. This included an entire new beater room, a new drying system, a total of 350 h. p. additional motors, and improvements in the cutter and rotary boiler departments. H. S. Shellington is vice-president and general manager; George F. Moxley, former sales manager, is now secretary of the company, and Elizabeth Killen, assistant secretary and assistant treasurer. With the mill completely modernized, the new organization intends specializing on high grade technical rope papers.

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SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
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F: HAGA — **"FORSHAGA"** Bleached Sulphite

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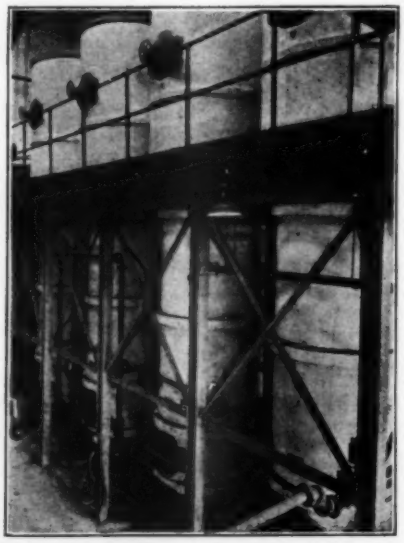

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MAXIMUM
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NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

EXPORTS

Exports of paper from the United States during March recorded an appreciable gain in point of value compared with the preceding month and also compared with the same month last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. Total exportations of paper of all classes in March reached a value of $2,549,897, contrasted with shipments valued at $2,134,522 during February this year, and exports valued at $2,349,941 in March last year.

Newsprint exports in March amounted to a total of 3,296,466 pounds, valued at $153,287, compared with 2,949,448 pounds of a value of $141,480 exported in the similar month of 1926, while exports of uncoated book paper in March were 982,065 pounds of a value of $91,931, against 1,552,152 pounds of a value of $155,365 in March last year. Exports of wrapping paper in March amounted to 2,807,035 pounds, valued at $194,751, against 2,832,981 pounds of a value of $241,005 in the same month a year ago; of writing paper, 958,131 pounds, valued at $199,810, against 823,165 pounds of a value of $141,269; of greaseproof and waterproof paper, 179,545 pounds, valued at $27,522, against 280,993 pounds of a value of $37,911; of surface-coated paper, 1,008,742 pounds, valued at $118,146, against 310,946 pounds of a value of $46,810; of blotting paper, 375,490 pounds, valued at $32,211, against 381,472 pounds of a value of $48,959, and of tissue and crepe paper, 309,298 pounds, valued at $78,636, against 277,286 pounds of a value of $76,275.

Exports of paper and products from the U. S. during the first quarter of 1927 showed a gain in value over both the preceding three-month period and the corresponding time in 1926. The quarter's trading was characterized by the generally lower average value and the downward trend in the volume of fine papers and paper specialties, the Paper Division of the Department of Commerce reports. The latter movement was particularly noticeable in book paper, tissues and tissue specialties, papeteries and envelopes. On the other hand, exports of newsprint and surface-coated papers improved considerably. Although newsprint shipments were well under the level of the first three months of 1926, they exceeded those of the preceding quarter by 9 per cent. No appreciable change was noticeable in wrapping paper exports, the volume exceeded the corresponding period in 1926 by 5 per cent but fell 3 per cent under the preceding quarter. Board shipments were well above those of a year ago, and also were in excess of the preceding quarter. Exports of the leading classes of paper during the first three months of the current year, with comparative figures for the similar period of 1926 follow:

Newsprint, 7,764,160 pounds, $358,358, against 10,750,155 pounds, $504,726 last year; uncoated book paper, 4,005,680 pounds, $337,245, against 3,866,203 pounds, $383,586; cover paper, 379,217 pounds, $67,202, against 398,243 pounds, $66,377; wrapping paper, 8,288,796 pounds, $579,097, against 7,895,012 pounds, $598,468; surface-coated paper, 2,090,704 pounds, $255,768, against 1,723,599 pounds, $206,372; toilet paper, 1,268,852 pounds, $161,584, against 1,113,691 pounds, $137,224; tissue and crepe paper, 999,393 pounds, $223,601, against 818,355 pounds, $223,792; boxboard, 12,486,637 pounds, $377,141, against 11,466,046 pounds, $323,960; other paper board, 9,408,499 pounds, $470,626, against 8,878,827 pounds, $485,960; blotting paper, 860,525 pounds, $97,096, against 918,202 pounds, $114,603, and sheathing and building paper, 3,533,672 pounds, $146,335, against 2,505,406 pounds, $118,209.

Exports of pulpwood from Canada during the first four months of this year totaled 583,957 cords, valued at $5,374,679, showing an appreciable gain over the 433,615 cords of a value of $3,966,043 exported in the corresponding time last year.

IMPORTS

Wood Pulp

Prices of imported wood pulp seem to have steadied following the recent rather sharp decline in the market. Buyers in some cases are operating on a fair scale, particularly those paper manufacturers who are accustomed to run on a single class of paper more or less all the time and who, therefore, can fairly accurately gauge their requirements ahead, although other consumers are buying in a very cautious manner chiefly against direct needs. It would appear, and it is the contention of those on the selling side of the trade, that prices have struck bottom for the time being, and there is a feeling in some quarters that a reaction upward may take place, especially should a spurt of concerted demand be encountered. Producers abroad, and particularly in the Scandinavian countries, are complaining that market values have eased to a level where there is little, or a complete lack of, profit in manufacturing pulp under prevailing costs to be marketed at today's prices, and if claims in this connection actually are true, it is probable the market will not long remain on present levels.

Importations of wood pulp into the United States during March showed an appreciable gain over the receipts in the preceding month but a slight loss from the imports in March of last year. According to U. S. Department of Commerce statistics, a total of 86,731 long tons of chemical wood pulp was imported into this country in March last, valued at $5,765,921, compared with imports of 80,114 tons of a value of $5,131,973 in February this year, and 88,403 tons of a value of $5,972,757 in March, 1926. During the first three months of the current year chemical pulp imports totaled 304,452 tons, giving a monthly average of 101,484 tons, contrasted with a monthly average of 96,711 tons in the corresponding period a year ago. Ground wood imports in March last were 21,202 long tons, valued at $638,302, compared with 11,360 tons of a value of $356,553 imported in the preceding month, and 21,800 tons of a value of $647,177 imported in March last year. Imports of ground wood in the first three months of this year were 48,971 tons, valued at $1,446,387, against 64,909 tons of a value of $1,884,358 in the same time a year ago.

Cable advices received during the early part of May announced that an agreement to curtail this year's output of mechanical pulp by 200,000 long tons, or more than one-third, had been signed by representatives of the Swedish and Norwegian wood pulp industries. The reduction was ordered on account of the unsatisfactory condition of the market. The output previously had been estimated at 253,000 long tons from the Swedish mills and 316,000 tons from Norway. This move on the part of the Scandinavian manufacturers doubtless will in time be creative of a much firmer ground wood market as there will be substantially less ground wood available in Europe, with the result British consumers likely will be obliged to look to Canada for a larger portion of their supplies and thus the statistical situation on the North American continent should be improved considerably. There has been an over-production of mechanical pulp for some time, and there is an appreciable surplus on the market at present

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E. B. EDDY COMPANY, LTD., Hull, Canada
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Dealers in Wayagamack Kraft Pulp

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EASTERN AGENTS of Sulphite Pulp
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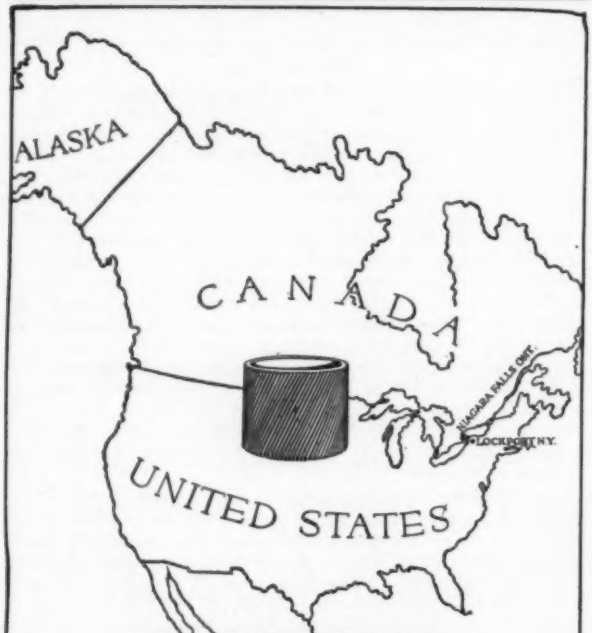

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Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

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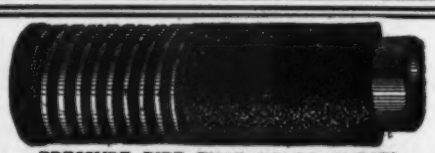

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Built in sizes 1 inch to 48 inches

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The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1927

which will have to be removed before it can be hoped for prices to reflect the curtailment of production in Scandinavia.

Strong unbleached sulphite is quoted in a majority of instances at around 2.70 cents a pound ex dock New York or other American Atlantic ports, but some sales of prime sulphite have been reported as low as 2.60 cents and as high as 3 cents for certain mill brands. Standard prime Swedish kraft pulp is quoted at 2.70 cents ex dock New York for forward shipment from abroad, this being the mill association basis now ruling. Bleached sulphite of prime grade is on a price range of 3.65 to 4 cents, with higher quoted for extra qualities. Dry ground wood is quoted around $34 per short ton ex dock at New York.

Current market quotations ex dock and receipts at the port of New York during May follow:

Bleached sulphite, No. 1	3.65- 4.25
Unbleached sulphite, strong No. 1	2.60- 3.00
Unbleached sulphite, No. 2	2.45- 2.75
Easy bleaching sulphite	3.00- 3.25
Mitscherlich unbleached, genuine	3.00- 3.25
Mitscherlich unbleached, ordinary	2.85- 3.00
Kraft, standard Swedish	2.70- 3.00
Ground wood, per ton (dry)	33.00-36.00

Scandinavian Pulp Agency, 635 bls. from Gothenburg, 3,500 Skutskar and 2,255 Sundsvall; J. Anderson & Co., 1,980 bls. from Fredrikstad, 259 Gothenburg and 616 Hamburg; E. J. Keller Co., 700 bls. from Bremen; Price & Pierce, 775 bls. from Gothenburg; Pagel, Horton & Co., 3,125 bls. from Gefle; Bulkley, Dunton & Co., 1,000 bls. from Gefle, 4,350 Memel, 1,300 Sundsvall and 1,700 Bremen; Castle & Overton, 1,652 bls. from Bremen and 1,326 Rotterdam; Buck, Kiaer & Co., 2,400 bls. from Stockholm; Johaneson, Wales & Sparre, 2,575 bls. from Sundsvall, 625 Gothenburg and 150 Hamburg; M. Gottesman & Co., 2,000 bls. from Sundsvall, 670 Rotterdam and 2,562 Trieste; Daniel M. Hicks, Inc., 338 bls. from Halmstad; E. M. Sergeant Co., 449 bls. from Gothenburg and 325 Oslo; Lagerloef Trading Co., 251 bls. from Hamburg and 74 Bremen; Robert Gair Co., 6,758 bls. and 984 half bales from Bridgewater, N. S.; Hudson Trading Co., 424 bls. from Trieste; Perkins-Goodwin Co., 125 bls. from Oslo; Chemical National Bank, 600 bls. from Oslo; W. Hartmann & Co., 125 bls. from Hamburg; Equitable Trust Co., 343 bls. from Antwerp; Order, 5,024 bls. from Helsingfors, 1,699 Hango, 2,500 Fredrikstad, 128 Hamburg, 2,370 Bremen, and 2,851 Raumo.

Paper Stock

Importations of paper stock other than wood pulp into the United States fell off considerably during May as compared with recent months, judging from receipts through the port of New York. There were fewer rags imported than in any month in a long time, and arrivals of old bagging, rope and other grades were comparatively light.

Imports of papermaking rags into the U. S. in the first three months of 1927, according to official figures issued by the Department of Commerce in Washington, were much smaller than last year, amounting to 98,330,727 pounds, valued at $2,083,526, compared with 136,644,596 pounds of a value of $3,313,410 imported in the corresponding period a year ago. Imports of waste bagging and waste paper in the same period totaled 18,870,639 pounds, contrasted with 33,476,546 pounds in the same time of last year, while imports of old rope and other paper stock were 14,643,160 pounds, against 20,032,405 pounds in the first three months of 1926.

Imports of all kinds of paper stock other than wood pulp at New York in May, 1927, these data being taken from manifests of steamers reaching that port during the month, follow:

Old Rope

N. E. Berzen, 361 coils; Brown Bros. & Co., 397 coils and 739 bls.; Penn Rag & Metal Co., 61 coils; United Fruit Co., 2 bls.; Ellerman's Wilson Line, 151 coils; American Express Co., 164 coils; L. S. Montefiore, 9 coils; Jaffe Products Co., 41 bls.; Alfred Bloch & Co., 97 bls.; New York Trust Co., 77 coils; E. J. Keller Co., 157 bls.; Order, 270 coils and 18 bls.

Old Bagging

Bulkley, Dunton & Co., 804 bls.; Bank of New York &

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The Mitts & Merrill Shredder will reduce magazines, books, old papers and boxboard, frozen or dried pulp laps, roll and sheet stock in a thoroughly economical manner.

Built in sizes with spouts ranging from 18 to 45 inches wide.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

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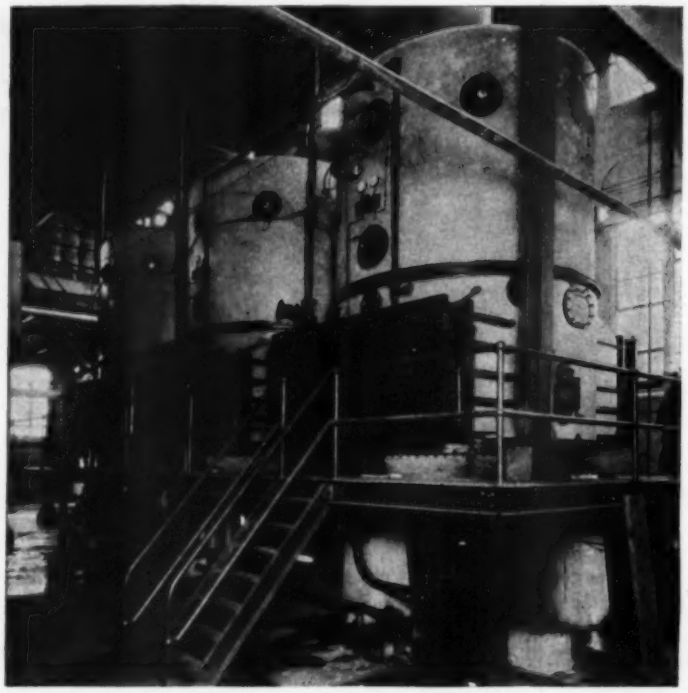

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for Pulp, Sulphite, Baling, Etc.

HYDRAULIC PUMPS, VALVES, FITTINGS, SHOCK ABSORBERS, PULP TRUCKS, ETC.

Southwark Hydraulic Presses for dehydrating pulp have proven sturdy and efficient machines in every one of the many pulp mills where we have installed them.

The right hand cut shows an installation of four 600-ton Southwark Presses in a large pulp and paper mill. These presses are designed for use with Southwark Pulp Trucks, the trucks are loaded and run under the press, the pulp being compressed directly on the truck.

This feature gives fast operation, saves labor and eliminates curbs, boxes or other containers on the press.

Southwark Pulp Truck, for Use with Presses Shown at the Right. Saves Time and Labor

Four 600-Ton Southwark Pulp Presses, Minnesota & Ontario Paper Co., International Falls, Minn.

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400 Washington Ave.
PHILADELPHIA, PA.

CHICAGO
343 S. Dearborn St.

Trust Co., 60 bls.; Alfred Bloch & Co., 31 bls.; Chase National Bank, 310 bls.; Melrose Paper Stock Co., 52 bls.; Castle & Overton, 269 bls.; E. J. Keller Co., 717 bls.; Order, 453 bls.

Rags

Castle & Overton, 605 bls.; E. J. Keller Co., 560 bls.; Atlas Waste Mfg. Co., 33 bls.; Bulkley, Dunton & Co., 734 bls.; Victor Galuap, Inc., 402 bls.; J. Cohen & Son Co., 191 bls.; Whaling Waste Products Co., 21 bls.; E. Butterworth & Co., 76 bls.; William Steck & Co., 82 bls.; Jaffe Products Co., 5 bls.; Darmstadt, Scott & Courtney, 190 bls.; A. H. Searle, Inc., 21 bls.; George W. Millar & Co., 279 bls.; J. Reiss & Co., 8 bls.; Atterbury Bros., 53 bls.; I. Hinerfeld, 18 bls.; J. Powell & Co., 25 bls.; Katzenstein & Keene, 89 bls.; Romeo Canovai & Figli, 75 bls.; Chemical National Bank, 111 bls.; New York Trust Co., 70 bls.; National City Bank, 23 bls.; American Exchange Irving Trust Co., 279 bls.; Chase National Bank, 108 bls.; French-American Banking Corp., 114 bls.; State Bank, 7 bls.; Hanover National Bank, 50 bls.; Union National Bank, 92 bls.; Guaranty Trust Co., 25 bls.; Anglo-South American Trust Co., 61 bls.; American Merchant Lines, 43 bls.; Amsinck, Sonne & Co., 18 bls.; Goldman, Sachs & Co., 101 bls.; American Express Co., 54 bls.; A. W. Fenton, Inc., 311 bls.; Brown Bros. & Co., 714 bls.; W. Schall & Co., 109 bls.; Amtorg Trading Co., 218 bls.; American Overocean Co., 50 bls.; Order, 391 bls.

Miscellaneous Paper Stock

William Steck & Co., 72 bls.; Anglo-South American Trust Co., 74 bls.; Philadelphia Girard National Bank, 52 bls.; Equitable Trust Co., 1,342 bls.; E. Butterworth & Co., 399 bls.; Bulkley, Dunton & Co., 151 bls.; Chase National Bank, 24 bls.; Brown Bros. & Co., 46 bls.; Salomon Bros. & Co., 109 bls.; New England Waste Co., 335 bls.; Milton Snedeker Corp., 93 bls.; Capital National Bank, 53 bls.; E. J. Keller Co., 1,368 bls.; Order, 350 bls.

Paper

Imports of paper into the United States in March last recorded an appreciable increase in value over the receipts in the preceding month, and also were slightly larger than in March a year ago, according to official statistics issued by the U. S. Department of Commerce. During March imports of paper of all kinds amounted in value to $12,237,474, compared with $10,110,993 in February this year, and $12,008,663 in March, 1926. In the first three months of the current year the United States imported paper to the value of $34,613,788, contrasted with imports worth $32,249,835 in the corresponding period last year.

Judging from arrivals at the port of New York in May, imports last month were about normal in volume. There were some sizable quantities of printing paper received, and also some big shipments of strawboard. Imports of paper of all kinds through the port of New York in May, 1927, these data being taken from manifests of steamers reaching that port during the month, follow:

Printing

H. Reeve Angel & Co., 11 cs. and 196 bls. from Helsingfors and 154 cs. from Bremen; Journal of Commerce, 211 reels from Helsingfors; Finnish Book Concern, 13 bls. from Helsingfors; Oxford University Press, 5 cs. from Liverpool; P. Puttmann, 5 cs. from Havre; New York Times, 78 reels from Gothenburg; A. S. Zabriskie, Inc., 167 reels from Bremen; Hudson Trading Co., 144 reels from Stockholm and 138 rolls from Sundsvall; Ossian Ray, 78 reels from Gothenburg; E. Dietzgen & Co., 101 cs. from Rotterdam and 4 cs. from Antwerp; C. Steiner, 103 cs. from Rotterdam and 37 cs. from Hamburg; M. Gottesman & Co., 170 reels from Stockholm; New York American and Evening Journal, 1,263 rolls from Hallstavik; B. F. Drakenfeld & Co., 50 cs. from Liverpool; P. C. Zuhlke, 143 cs. from Antwerp; Watch Tower Bible & Tract Society, 75 reels from Helsingfors; Parsons & Whittemore, 30 bls. from Raumo and 120 reels from Hamburg; Keuffel & Esser Co., 107 rolls from Hamburg; Perkins-Goodwin Co., 844 bls. from Hamburg and 37 cs. from Glasgow; Gallagher & Ascher, 8 bls. from Liverpool; Bank of Montreal, 6,389 rolls from Corner Brook, N. F.; Perry, Ryer & Co., 105

Starch

ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

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SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

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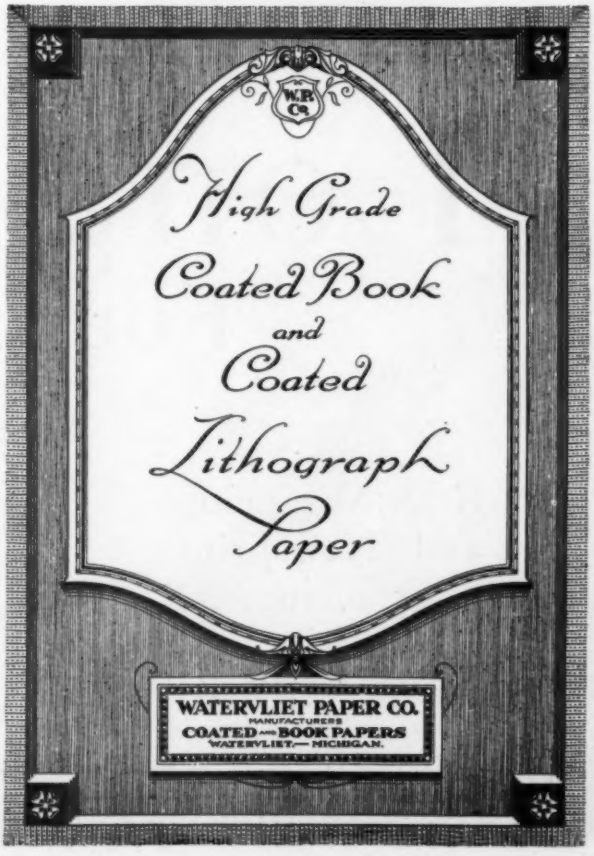
Starch



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Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

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Woolen Manufacturers Since 1856

REPRESENTATIVES

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Longcrimp
Fourdrinier
Wires

USED EXTENSIVELY ON

Kraft, Wrapping and Newsprint Machines

Give Longer Average Service than the Regular Weave

Made By

The Lindsay Wire Weaving Company

(Collinwood Station) CLEVELAND, OHIO

See page 363 in the 1926 Paper and Pulp Mill Catalogue

cs. from Glasgow; Vernon Bros., 38 cs. from Glasgow; F. Henjes, Jr., 62 rolls from Hamburg; Public National Bank, 36 cs. from Marseilles; Martin & Bechtold, 13 cs. from Hamburg; Order, 31 bls. from Hamburg, 779 reels and 20 cs. from Bremen, and 8 reels from London.

Wrapping

Goldsmith & Co., 195 bls. from Gothenburg; C. K. MacAlpine & Co., 352 bls. and 35 cs. and 579 reels from Gothenburg; Arkell Safety Bag Co., 586 rolls from Gothenburg; Quality Art Novelty Co., 31 cs. from Hamburg; Crepe Kraft Co., 36 rolls and 5 bls. from Gothenburg; Borregaard Co., 1,604 rolls and 229 bls. from Gothenburg; Birn & Wachenheim, 72 cs. from Antwerp and 4 cs. from Southampton; Wilkinson Bros. & Co., 29 cs. from Gothenburg; Chemical National Bank, 44 rolls from Gothenburg; National City Bank, 50 bls. from Genoa; Robert Wilson Paper Corp., 84 rolls from Antwerp; J. P. Heffernan Paper Co., 22 bls. from Hamburg; British-American Tobacco Co., 127 bls. from Trieste; International Acceptance Bank, 122 pkgs. from Oslo; Schenkers, Inc., 29 cs. from Hamburg and 12 cs. from Bremen; Order, 222 bls. from Hamburg and 58 cs. from Bremen.

Cigarette

British-American Tobacco Co., 5 cs. from Liverpool; R. J. Reinolds Tobacco Co., 400 cs, from Havre and 1,580 cs. from St. Nazaire; Standard Products Corp., 419 cs. from Havre; P. J. Schweitzer, Inc., 54 cs. from Marseilles, 3 cs. from Havre and 56 cs. from Genoa; Southern Pacific Co., 3 cs. from Havre; Ionian Products Trading Co., 8 cs. from Vigo; Surbrug Co., 15 cs. from Havre; American Tobacco Co., 1,470 cs. from Bordeaux; DeManduit Paper Corp., 594 cs. from St. Nazaire; M. Spiegel & Sons, 36 bls. from Genoa and 27 cs. from Hamburg.

Filter

G. Leuders & Co., 3 cs. from Havre; E. Fougera & Co., 54 cs. from Southampton; A. Giese & Son, 10 bls. from Southampton and 5 cs. from Hamburg; Standard Products Corp., 7 cs. from Liverpool; H. Reeve Angel & Co., 17 cs. from London; C. Sleicher & Scholl Co., 9 cs. from Hamburg; Order, 16 cs. from London.

Writing

A. Murphy & Co., 3 cs. from Havre; American Express Co., 3 cs. from Havre and 9 pkgs. from Southampton; Guibont Freres & Co., 13 cs. from Southampton and 5 cs. from Havre; E. Walker, 4 cs. from Trieste; A. M. Capen's Sons, 19 bls. from Trieste; Kauri Bros., 6 cs. from Havre; Gallagher & Ascher, 3 cs. from Southampton; F. L. Kraemer & Co., 6 cs. from London.

Drawing

Keuffel & Esser Co., 72 rolls and 102 cs. from Hamburg; H. Reeve Angel & Co., 6 cs. from London; Globe Shipping Co., 21 cs. from Bremen.

Tissue

J. B. Mast & Co., 22 cs. from Genoa; Iwai & Co., 3 cs. from Kobe; F. B. Vandegrift & Co., 49 cs. from Liverpool; Schenkers, Inc., 33 cs. from Hamburg.

Hanging

A. C. Dodman Jr., Inc., 16 bls. from Southampton and 17 bls. from Liverpool; Wedemann, Godknecht & Lally, 5 bls. from Hamburg; F. J. Emmerich & Co., 56 bls. from Hamburg, 9 bls. from Liverpool and 10 cs. from London; G. J. Hunken & Co., 4 bls. from Hamburg; W. H. S. Lloyd & Co., 24 bls. from Liverpool; J. E. Bernard & Co., 14 bls. from Antwerp, 3 bls. from Hamburg and 8 cs. Southampton; C. A. Haynes & Co., 50 bls. from Liverpool and 102 pkgs. from London; R. F. Downing & Co., 6 pkgs. from London; Panama-Pacific Line, 10 pkgs. from London; F & R Trading Corp., 491 bls. from Antwerp; F. A. Binder, 4 bls. from Bremen; Order, 9 cs. from Hamburg.

Board

Fibre Case & Novelty Co., 54 bls. from Gothenburg; Overton & Co., 5 cs. from Hamburg; A. B. Massa Paper Corp., 228 pkgs. from Rotterdam; O. M. Baxter, Inc., 45 cs. from

DAYTON
High Speed
Beaters

Well onto fifty mills are now using one or many Dayton High Speed Beaters. Many of these mills have ordered additional "Dayton" equipment after watching the successful performance of initial installations. Data compiled discloses:

Heavier Furnishes
Faster Beating
Greater Output
More Uniform Product
Saving in Power
Saving in Labor

We invite you to investigate the Dayton High Speed Beater because their installation in your mill would unquestionably prove advantageous to you.

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501 Fifth Ave., New York, N. Y.
THE DAYTON BEATER & HOIST CO.
Dayton, Ohio

Conditions Fourdrinier Wires Must Meet!

A FOURDRINIER WIRE must meet many exacting requirements—

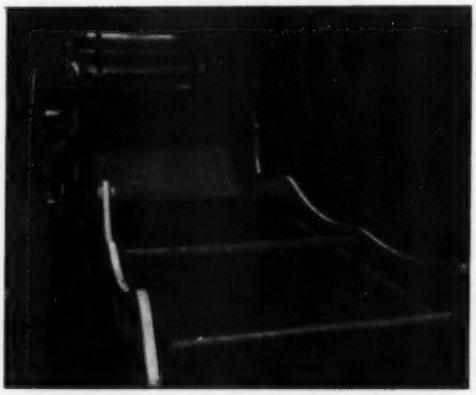
It must stand stretch and strain without sagging.

It must resist the chemical action of the stock.

It must bear the weight of the stock.

It must withstand the friction of the suction boxes, table rolls and the weight of the deckle straps.

These exacting requirements are being met by Tyler Fourdrinier Wires. They are accurate in mesh and unvarying in quality of wire. Wear, corrosion, stretching or friction find them extremely difficult to attack and every square foot can be depended upon.



Paper makers specify Tyler Quality Fourdrinier Wires because they make for quality paper—for continuous and profitable production.

THE W. S. TYLER COMPANY, Cleveland, Ohio

TYLER FOURDRINIER WIRES

CYLINDER WIRES BACKING WIRES WASHER WIRES CORDUROY WIRE CLOTH HUM-MER ELECTRIC SCREENS

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

Gothenburg; Lagerloef Trading Co., 181 bls. from Helsingfors; Adrian Vuyck, 1,121 reels from Rotterdam; H. H. Ayer, Inc., 4 cs. from Havre; Robert Wilson Paper Corp., 346 reels from Rotterdam; Coty, Inc., 46 cs. from Havre; Grand Corrugated Paper Co., 180 reels from Rotterdam; J. P. Heffernan Paper Co., 523 reels from Rotterdam; Perkins-Goodwin Co., 560 reels from Rotterdam and 24 bls. from Hamburg; Brooks Paper Co., 6 cs. from Liverpool; H. Brocklebank, 8 bls. from London; Half Moon Manufacturing and Trading Co., 13 reels from Rotterdam; Haas Bros., 468 reels from Rotterdam and 4 bls. from Hamburg; Acme Novelty Co., 13 cs. from Antwerp; Spaulding & Trekobey, 106 rolls from Rotterdam; Premier Flong Co., 74 cs. from Hamburg; Order, 18 rolls from Rotterdam and 77 cs. from Hamburg.

Photo

Globe Shipping Co., 391 cs. from Bremen; Gevaert Co. of America, 53 cs. from Antwerp; P. Puttmann, 61 cs. from Antwerp; P. C. Zuhlke, 199 cs. from Antwerp; Order, 155 cs. from Antwerp.

Miscellaneous

E. M. Sergeant Co., 7 cs. from Gothenburg; Coenca-Morrison Co., 5 cs. from Southampton and 6 cs. from Havre; Keller-Dorian Paper Co., 33 cs. from Southampton; Whiting-Patterson Co., 51 cs. from Southampton, 19 cs. London and 30 cs. from Hamburg; G. W. Sheldon & Co., 12 cs. from Havre; P. J. Schweitzer, Inc., 10 cs. from Marseilles; Japan Paper Co., 85 cs. from Havre, 36 cs. Genoa, 6 cs. Southampton and 29 cs. from Rotterdam; D. C. Andrews & Co., 14 cs. from Havre and 129 cs. from Hamburg; S. Gilbert, 7 cs. from Havre and 39 cs. from Rotterdam; First National Bank of Boston, 28 cs. from Hamburg; Meadows, Wye & Co., 5 cs. from London; Hudson Forwarding & Shipping Co., 7 cs. from Antwerp; International Forwarding Co., 83 cs. from Hamburg and 37 cs. from Rotterdam; Eleto Co., 3 cs. from Bremen; Brown Bros. & Co., 6 cs. from Hamburg; American Express Co., 9 cs. from Hamburg; Yardley & Co., 15 cs. from London; Fidelity Trust Co., 27 cs. from Rotterdam; American Exchange Irving Trust Co., 4 cs. from Rotterdam; A. B. Scott, 8 reels from Rotterdam; Standard Products Corp., 7 cs. from Bremen; Milton Snedeker Corp., 17 cs. from Hamburg; F. C. Strype, 283 cs. from Hamburg and 32 cs. from Antwerp; Baldwin Universal Co., 12 cs. from Hamburg; Walker-Goulard-Plehn Co., 25 cs. from Gothenburg, 56 bls. from Helsingfors and 61 cs. from Bremen; E. Walker, 49 bls. from Gothenburg; H. Reeve Angel & Co., 91 cs. from Helsingfors and 20 bls. from Southampton; Borden & Riley Paper Co., 21 cs. from Antwerp; Hensel, Bruckman & Lorbacher, 2 cs. from Rotterdam and 43 cs. from Havre; National City Bank, 5 cs. from Rotterdam; Globe Shipping Co., 6 cs. from Rotterdam; J. Beckhardt Co., 31 cs. from Rotterdam; W. J. Byrnes & Co., 6 cs. from Liverpool; International Acceptance Bank, 2 cs. from Hamburg; Haviland China Co., 6 cs. from Havre; Causon & Montgolfer, 39 cs. from Havre; P. H. Petry & Co., 8 pkgs. from Havre, 11 cs. from Rotterdam and 12 cs. from Hamburg; R. F. Downing & Co., 2 cs. from Havre; Quality Art Novelty Co., 50 cs. from Hamburg; Lorscheider, Schang & Co., 7 cs. from Hamburg; Bendix Paper Co., 14 cs. from Hamburg; Tice & Lynch, 3 cs. from London; Sinclair & Valentine, 5 cs. from Hamburg; Tamm & Co., 8 cs. from Hamburg and 2 cs. from Rotterdam; F. Murray Hill, Inc., 7 cs. from Bremen; Charles W. Williams & Co., 7 cs. from Antwerp.

Technical Association Papers (1927)

The tenth series of **Technical Association Papers**, which was started in 1918, has just been published. In it are brought together the papers and addresses presented at the annual meeting with a full stenographic report of discussion on them, as well as a considerable volume of valuable reference material relating to pulp and paper manufacture.

The leading articles cover all branches of paper and have particular reference to the latest developments in the industry, besides several papers covering experimental laboratory work, there are the bibliographies of papermaking for 1926, the bibliography of paper sizing, and the complete list of patents relating to paper issued in United States in 1926.

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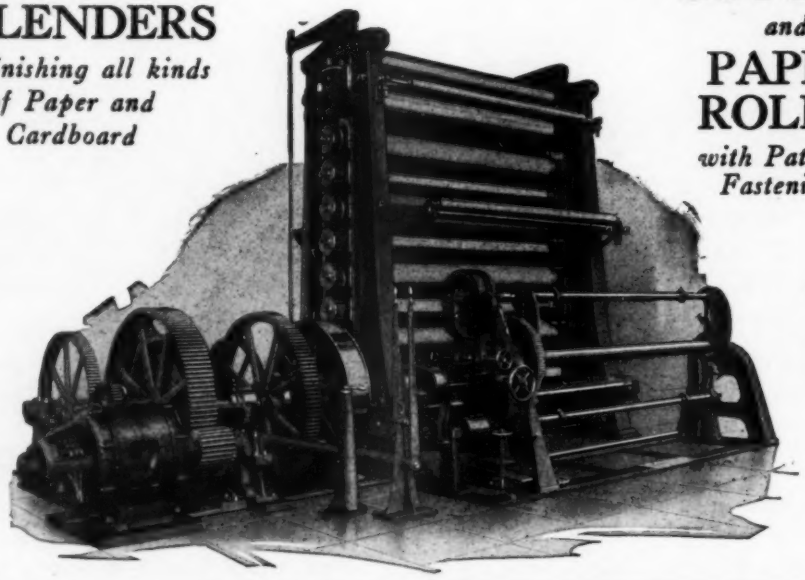

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FROM memory, call the roll of the larger paper manufacturers. Then look at a complete list of them—in Thomas' Guide, for example. Practically every paper manufacturer uses at least one Biggs Bleaching Boiler, and many are 100% Biggs equipped.

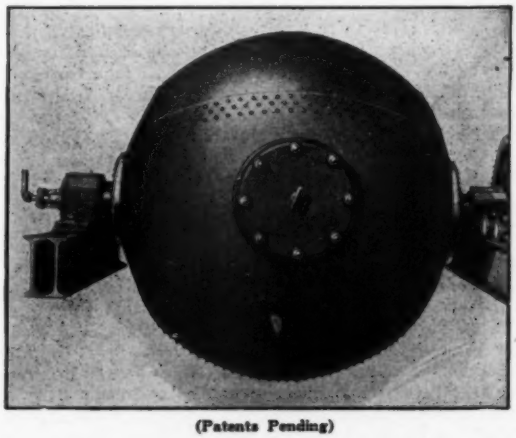
Here are typical excerpts from a letter written by the Standard Paper Manufacturing Company, of Richmond:

"We have been using your first two Cylinder Rotary Bleaching Boilers with very satisfactory results. Later, we bought two more from you.

"We consider the last two the best that we have for our purposes. We use these boilers exclusively for cooking rags.

"If you care to refer parties to us who contemplate buying this class of machinery, we will be very glad to recommend your boilers."

May we discuss your present requirements?



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